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DISEASES CAUSED BY BACTERIA AND FUNGI

ROUNTREE, P. M., & THOMSON, E. F. (1949.)
Incidence of penicillin-resistant and streptomycin-resistant staphylococci in a hospital.—*Lancet*. 257. 501-504. [Authors' summary copied *verbatim*.] 827

Of 228 strains of *Staph. pyogenes* isolated from 196 patients in a general hospital, 107 (47%) isolated from 104 patients were penicillin-sensitive, and 121 (53%) from 92 patients were penicillin-resistant; 216 strains (84.5%) were streptomycin-sensitive, and 12 (5.5%) were streptomycin resistant.

Phage typing of the strains showed that no predominant phage types occurred among the penicillin-sensitive strains, but among the penicillin-resistant strains 75 belonged to five phage types, with two types predominating.

Analysis of case-records of patients yielding penicillin-resistant staphylococci showed only 8 cases of clinical staphylococcal infection in which infection occurred with certainty outside the hospital community; 54 cases were considered to have been cross-infected while in hospital. In 4 cases conversion to penicillin resistance occurred while in hospital. Most of the cases of cross-infection were those of clean surgical wounds, and the evidence indicates that they were infected with strains already penicillin-resistant at the time of entry into the wound. Surveys of the nasal carrier-rate of penicillin-resistant *Staph. pyogenes* in 200 members of the hospital staff and in an unselected group of 200 blood donors showed a carrier-rate of 32% in the hospital staff compared with 4% in the blood donors. A close correspondence was found between the distribution of phage types present in the noses of the staff and in the lesions of patients cross-infected in hospital.

MAASS, E. A., & JOHNSON, M. J. (1949.) **The relations between bound penicillin and growth in *Staphylococcus aureus*.**—*J. Bact.* 58. 361-366. [Authors' summary copied *verbatim*.] 828

The penicillin previously reported to be firmly bound by resting *Staphylococcus aureus* cells has been found to remain largely bound during

subsequent multiplication of the cells in a penicillin-free medium. At low penicillin concentrations (0.01 to 0.04 units per ml) penicillin uptake is apparently unchanged in amount, but is much slower, many hours being required for completion of the reaction. In a medium capable of supporting growth, cells in the presence of penicillin continue to bind penicillin, indicating more rapid synthesis of the penicillin-binding component than of cell substance. The relation of these findings to the mode of action of penicillin is discussed.

FAGRAEUS, A. (1949.) **Influence of sodium chloride on growth of staphylococci and some other bacteria.**—*Acta path. microbiol. scand.* 26. 655-665. [In English. Author's summary slightly modified.] 829

All the 56 coagulase-positive strains of *Staphylococcus aureus* disclosed abundant growth in serum broth containing up to 8-10 per cent sodium chloride. A marked inhibition of growth occurred at a sodium chloride concentration of 16-18 per cent. *B. coli* and *Proteus vulgaris* were clearly inhibited by a sodium chloride content of 10 per cent. The growth of *Proteus* was further restrained when the concentration of sodium chloride was increased to 14 per cent. Cultivation of *Staphylococcus aureus* together with *B. coli* and *Proteus* on a 10-14 per cent sodium chloride broth caused a good accumulation of the staphylococci.

A 10 per cent of sodium chloride broth was considered to be the best accumulative substrate for staphylococci.

BOVIM, A. (1949.) Melkens celleindhold, katalasetall og sediment ved mastitis. [Cell content, catalase index and sediment of milk in mastitis.]—*Nord. Vet.-med.* 1. 760-768. [Abst. from English summary.] 830

The pH value, chloride content, sediment, catalase value and cell count and their significance to the diagnosis of mastitis were discussed and details of the technique were described, tests being made on cows infected with staphylococci and streptococci.

There was good agreement between the leucocyte count and the catalase value.

WARD, A. H., CASTLE, O. M., HOW, C., & NIELSEN, E. P. (1944-45.) **Investigations into field conditions associated with mastitis in a sample of 32 herds over a three-year period (1942-43 to 1944-45).**—*Rep. N.Z. Dairy Bd.* 1944-1945. pp. 46-69. **831**

A three-year survey was undertaken by two consulting officers of the Herd Recording Council to study the field conditions associated with clinical mastitis and to investigate conditions of management in high-incidence herds as compared with those in herds with a low incidence of mastitis, general differences in feeding conditions between such groups, and also other factors associated either with a high general incidence or a low general incidence of clinical mastitis.

There was considerable variation from year to year in the incidence of clinical mastitis in any particular herd. Only a very small proportion of these herds continued over the three-year period with a low incidence of clinical mastitis; in a small proportion of herds the mastitis incidence remained high over the same period.

Studies of milking machine conditions, shed management and shed hygiene failed to reveal any clear-cut association between particular practices in "high incidence herds" as compared with "low incidence herds". The importance of good general hygiene is not to be depreciated, but it still remains to be demonstrated just what particular practices are important from the point of view of mastitis control.

The observations indicated that there might be an association between nutrition and mastitis, but the data were not suitable for statistical study.

The data on clinical incidence of mastitis in daughter-dam pairs indicated a small general difference in degree of inherent resistance to mastitis infection. General histories based not only on the mastitis history of the dam but also on progeny test observations in the case of the sire, will need to be compiled in order to obtain reasonably conclusive evidence on the problem of inheritance of susceptibility to mastitis.

Some indication of the economic importance of sub-clinical mastitis was furnished by observations on the reduction in milk yield in quarters with high leucocyte counts.—M. B. BUDDLE.

BOLTON, W. D., WALLER, E. F., FRAYER, J. M., & CADY, J. H. (1949.) **Procaine penicillin G levels in udder during treatment of chronic mastitis.**—*Proc. XIIth Internat. Dairy Congr., Stockholm.* Vol. I. Sect. I & VI. 555-559. [In English: English, French & German summaries, abstr. from English summary.] **832**

Procaine penicillin G in varying amounts was introduced into 122 quarters. The number of Oxford units remaining at the end of eight hours is far in excess of that required to inhibit the growth of streptococci. In the limited number of field trials with procaine penicillin G in treatment of clinical mastitis results were good in recently developed cases. The use of 25,000 O.U. in each infected or suspicious quarter gave results as satisfactory as when twice or three times the amount was used.

McCULLOCH, E. C., KISER, J. S., & MIGAKL, H. (1949.) **Aureomycin in the treatment of staphylococcal mastitis in cows.**—*Vet. Med.* **44.** 253-258. **833**

Aureomycin was used in the treatment of bovine mastitis in 61 quarters of 16 cows, given *via* the teat either as an infusion or in an ointment base in collapsible tubes.

The aureomycin levels were higher even after 72 hours with doses of 200 mg. per quarter in 7.5 g. ointment base than with the infusion. Treatment with 100 mg. per quarter resulted in 50% cures in 24 quarters; with 150 mg. 61% cures in 23 quarters, and with 200 mg. 86% cures in 14 quarters, all within 21 days. No irritation or lower milk yield was observed in using aureomycin.—M. WOODBINE.

LEVIN, B. (1948.) **[Udder infusions with tyrothricin "ARA"].**—*Refuah vet. Palestine.* **5.** 16. [Abstr. from English translation & summary, p. 32.] **834**

Emulsions containing either 1.55 mg. or 0.35 mg. per ml. of tyrothricin (a bacterial agent containing gramicidin and tyrocidine) caused irritation when 15 ml. were infused into the udder; a second infusion 8-24 hours later, however, caused less irritation than the first one.—J. I. T.

KÄSTLI, P., & BINZ, M. (1948.) **Die Bedeutung der Euterinfektion für die Entstehung von katarrhalischen Sekretionsstörungen (Euterkatarrhen) bei der Milchkuh. [The significance of udder infection in udder catarrh in dairy cows.]**—*Schweiz. Arch. Tierheilk.* **90.** 349-381. **835**

The udders of 14 cows of a dairy herd were observed from Oct. 1943 to Sept. 1947. In several cows there were pathological changes of the milk without bacterial infection of the udder ("aseptic catarrh"). The authors consider that these changes might be traumatic in origin.

Normal milk samples (cell count less than 100 per ml., catalase test less than 20 after 3 hours) were found in 92.2% of samples without infection, in 86.4% of samples with *Corynebacterium lipolyticum*, in 82.1% of samples with enterococci, in 74.8% of samples with *Staphylococcus albus*, in

44.6% of samples with *Staph. aureus* and in 14.5% of samples with *Streptococcus agalactiae*. These differences were found to be statistically significant.

In streptococcal infections a definite relation between bacterial count and alteration of the secretion could be demonstrated.

External influences decreasing the resistance of the udder, particularly traumata, can bring about the transition of the infection from the latent to the clinically manifest stage. This occurs more easily in udders harbouring organisms of higher pathogenicity such as *Str. agalactiae* and *Staph. aureus*. In the control of udder catarrh only these two infections have to be considered.

The observations demonstrate the importance of the methods of milking, traumatic lesions favouring transition of old infections from the latent to the manifest stage and entrance of new infections into the udder.—W. STECK.

LEGLER, F. (1949.) Ueber einen nicht haemolysierenden Streptokokkenstamm der serologischen Gruppe C als Erreger einer Meerschweinchenseuche. [A non-haemolyzing strain of the serological group C of streptococci causing an infectious disease in guinea pigs.]—Berl. Münch. tierärztl. Wschr. No. 9. pp. 115–119. 836

An epizootic caused by capsulated streptococci occurring amongst a stock of g. pigs affected by under-nourishment and nutritional deficiencies is described.

The pleura and pericardium were predominantly affected; they were covered with fibrinous-purulent membranes and very slimy grey exudates developed; these exudates were almost free from leucocytes or lymphocytes. The organisms were not fibrinolytic, completely inert with regard to blood, resistant to 60°C. for half an hour. Serologically they belonged to Lancefield Group C. They were found regularly in throat swabs of affected animals and it was assumed that the infection was transmitted by inhalation. The author suggests that the organism be regarded as a non-haemolytic variant of *Str. pyogenes animalis*.—A. MAYR-HARTING.

FLIGHT, C. H. (1949.) Two outbreaks of anthrax in equines due to ingestion of contaminated oats.—J. S. Afr. vet. med. Ass. 20. 42–44. 837

In an outbreak lasting 11 days 29 horses and mules out of a total of 69 died from anthrax and the veterinary surgeon who conducted the P.M. examinations developed a malignant pustule in spite of a prophylactic novarsenobillon (neosalvarsan) injection. The source of infection was considered to be oats from a blood-stained bag

which was found to have anthrax spores on the stained portion. Another outbreak in a second stable was possibly caused by a similar contamination.—K. G. TOWERS.

LEVADITI, C., & HENRY, J. (1947.) Mode d'action de la streptomycine sur le *Bacillus anthracis* in vitro. [Action of streptomycin on *Bacillus anthracis* in vitro.—C.R. Soc. Biol. Paris. 141. 583–584. 838

This is an extension of a previous study by the authors on *Bact. coli* and *B. subtilis* in which streptomycin was found to be highly effective against *B. anthracis*.

Morphological changes such as elongation, crinkled edges and coccoid forms, occurred in the organisms, depending upon streptomycin concentration and time of contact, and are brought out by the silver impregnation method. A table is given of the time taken to kill *B. anthracis* at different concentrations.

The antibiotic effects on the bacilli precede the degenerative changes by some hours.—M. W.

DELPY, P.-L., & MIR CHAMSY, H. (1949.) Sur la stabilisation des suspensions sporulées de *B. anthracis* par l'action de certains antiseptiques. [Stabilisation of the spores of *B. anthracis* with certain antiseptics.]—C.R. Acad. Sci., Paris. 228. 1071–1073. 839

Suspensions of sporulating cultures of *B. anthracis* present some problems for vaccine preparation. Before titrating them the vegetative forms have to be eliminated; the spores then have to be kept under conditions that will not change their viability and antigenic properties, but will not allow them to germinate. Pure neutral glycerin gives satisfactory results for vaccines in a fluid medium, but cannot be used for freeze-dried vaccines. The authors found that sodium-ethylmercuri-thio-salicylate (merthiolate) in 1:20,000 causes all vegetative forms to disappear within four days. Number and immunizing power of the spores remain intact. There is no change in the biological properties of freeze-dried suspensions of spores in merthiolate saline when examined after one year.—A. MAYR-HARTING.

MOLNÁR, I. (1949.) The reducing capacity of *Bacillus anthracis* and *Bacillus mesentericus*.—Acta vet. hung. 1. 86–88. [In English, abstr. from author's summary.] 840

Both *B. anthracis* and *B. mesentericus* can reduce prontosil soluble, but in concentrations of the dye over a given range complete reduction takes place only if there are enough non-capsulated specimens of bacilli of either species to be found in the culture. For this reason strains of non-capsulated bacilli reduce prontosil in a relatively short time, whereas capsulated strains change the

colour of the broth containing prontosil either not at all, or only after a longer period.

The latter possibility may be expected only in dissociation; the non-capsulated variants, split off from the capsulated strains, completely reduce the prontosil during their growth period. The time at which decoloration eventually took place in cultures of capsulated strains was variable, depending on the time at which dissociation occurred.

INNES, J. R. M. (1949.) **Tuberculosis in the horse.**—*Brit. Vet. J.* 105. 373-383. 841

The incidence, clinical diagnosis, and the histology of TB. in the horse are described. The many gaps in our knowledge of the pathogenesis of this disease in the horse are emphasized. The lesions are proliferative in character and rarely caseate or calcify in contrast to the lesions in man and in cattle.

The pathological affinities of the tuberculous lesion in the horse and the non-caseating proliferative TB. of man and other pathologically related conditions, such as Boeck's sarcoid, are discussed.—D. LUKE.

STAMP, J. T. (1948.) **Bovine pulmonary tuberculosis.**—*J. Comp. Path.* 58. 9-23. 842

The pathology and morbid histology of material from 100 cases of bovine TB. selected because the lesions appeared to be confined to the thorax were studied. In 89 of the cases primary lung foci were the origin of the thoracic lymph node TB. and in 72 of these there was a single lung focus and in the remaining 17, 2-5 foci. Of the remaining 11 cases the lesions were so far advanced in eight that the site of the primary focus could not be determined and in three cases no lung lesions could be found.

The anatomical relationship between the TB. in the bronchial-mediastinal lymph node and the primary lung focus is described.—D. LUKE.

SCHMID-LAMBERG, H. (1948.) **Erfahrungen mit der Viehtuberkulose im heutigen Deutschland. [Bovine tuberculosis in present-day Germany.]**—*Schweiz. Arch. Tierheilk.* 90. 524-527. 843

More than 40% of the cattle and more than 55% of the pigs in the eastern Zone of Germany are infected with TB. The disease is particularly prevalent in areas where farm buildings have been damaged as a result of the war. Mortality has also increased in these areas in recent years.—W. S.

HÜLPHERS, G., & LILLENGEN, K. (1947.) **Tuberkulos hos vilt levande däggdjur och fåglar. [Tuberculosis in wild mammals and birds.]**—*Svensk VetTidskr.* 52. 193-208. [Abst. from English summary.] 844

As in wild mammals, TB. among wild birds is very rare. A great many species of birds may,

however, develop TB. when kept in captivity. Among wild mammals TB. has been observed in roe deer (*Capreolus capreolus*), red deer (*Cervus elaphus*), elk, hare, wild boar and badgers.

Among material from game sent in to the Bacteriological Section of the Stockholm Veterinary College, TB. was found in 1 elk, 2 capercaillie, 5 blackcock, 3 pheasants and 1 pigmy owl. With the exception of the elk, 1 capercaillie and 2 pheasants, the animals had been kept in captivity. The lesions are described.

A smear from a granuloma of the lung contained numerous bovine type tubercle bacilli.

In TB. in wild birds changes appear which are similar to those in tuberculous fowls.

GREGORY, T. S. (1949.) **The accuracy of diagnostic methods used in the detection of tuberculous cattle.**—*Aust. vet. J.* 25. 138-152. 845

A review of some recent developments in tuberculin testing which includes references to G.'s own studies. The efficacy of the complement-fixation test as an aid in diagnosis was investigated. The test was discarded because of the high proportion of false negatives and false positives encountered. The effect of a fairly large dose of tuberculin on the serological response of the animal was studied as a possible means of improving the C.F. test. A thermal reaction was noted and from these observations G. elaborated a "short thermal test" (S.T.T.). The dose recommended is 4.0 ml. Commonwealth Serum Laboratories intradermal tuberculin.

G. says:

"The dose of tuberculo-protein thus inoculated probably exceeds 8 times the amount used in the older subcutaneous tuberculin test. In the majority of tuberculous animals tested with this larger dose a characteristic thermal response is obtained within 8 hours of injection. On this basis a test has been designed in which cattle with a temperature of 102.8°F. or below are inoculated as above [*i.e.*, subcutaneously into the neck] and another temperature taken within the first 2 hours to indicate the normal range. Thereafter temperatures are taken at the 4th, 6th and 8th hours following inoculation. If the normal range as indicated by the first two temperatures does not exceed 102.8°F. and if any subsequent temperature rises to 104°F. or above, the animal is considered to be a reactor. The test is suitable only for cattle accustomed to handling and is recommended . . . as a supplementary test in the detection of generalized cases not reacting to the intradermal test, and as a check test in problem herds in order to minimise unnecessary slaughter of N.V.L. [*i.e.*, no-visible-lesion] reactors to the intradermal test."

Some figures to support these claims are cited, *e.g.* 122 out of 133 tuberculous cattle reacted within 8 hours; 10 out of 62 N.V.L. cases reacted to the S.T.T.

In discussion on the paper Maunder reviewed factors influencing the caudal intradermal test as

applied in Queensland. Using a S.T.T. modified to suit Queensland's climate, M. found that in 40 head of cattle only 18 reacted to the S.T.T. whereas lesions were found P.M. in 36. Speakers from other states reported favourable results with the S.T.T. in limited trials. A considerable proportion of the discussion was devoted to the vagaries of the single caudal intradermal test which is most extensively employed in Australia.—R. B.

BENDA, R., & URQUIA, D. A. (1947.) La pratique du granulo-diagnostic de la tuberculose. [Diagnosis of tuberculosis by examination of granules in neutrophile polymorphonuclear leucocytes.]—*Progr. méd. Paris*. No. 8. pp. 195–198. 846

Blood was obtained by digital puncture, spread on a slide and stained by the May-Grunwald-Giemsa method. The authors recognized three types of neutrophils in such preparations: (1) Normal (GN), in which the granules appeared as a fine dust set in transparent cytoplasm. (2) Frankly pathological (G⁺ and even G⁺⁺), in which the granules were increased in number, unequally and irregularly increased in size and were often associated in large clumps. (3) Intermediate (G)[±], represented by simple numerical increase without hypertrophy or clumping. The essential feature was the dirty, opaque appearance of the cytoplasm.

A differential neutrophile count can be made using this classification. This the authors call a "granulogramme". Departure from the normal granulogramme provides a very useful diagnostic factor.

There is a concluding section on interpretation, based on the estimation of more than 8,000 granulogrammes.—L. M. MARKSON.

REMLINGER, P., BAILLY, J., & NIETO, A. (1948.) Le granulo-diagnostic de la tuberculose. [Diagnosis of tuberculosis by examination of granules in polymorphonuclear leucocytes.]—*Arch. Inst. Pasteur Alger*. 26. 242–248. 847

The authors applied the technique of Benda and Urquia [see preceding abst.] to the diagnosis of TB. While admitting that the demonstration of the tubercle bacillus in sputum, gastric washing, etc., is absolute proof of the infection, the authors claim that this test is simpler and more practical, and simpler even than the tuberculin test. The test was negative in normal people and in the many cases of various diseases in which it was used. Errors seemed to be in the order of 1–2%.

—L. M. MARKSON.

BERRY, J. W., & LOWRY, H. (1949.) A slide culture method for the early detection and observation of growth of the tubercle bacillus.—*Amer. Rev. Tuberc.* 60. 51–61. [English and

Spanish summaries. English summary copied verbatim.] 848

A technically simple method by which *M. tuberculosis* can be cultivated directly from sputum on slides is described. Growth of the micro-organism is evident in from one to six days. Although the experience is too limited to justify final conclusions, the results suggest that this may be a useful method for the rapid diagnostic demonstration of the tubercle bacillus. It is believed that, because of its simplicity, this method will be a useful research tool.

ALLGÖWER, M., & BLOCH, H. (1949.) The effect of tubercle bacilli on the migration of phagocytes *in vitro*.—*Amer. Rev. Tuberc.* 59. 562–566. [Spanish summary. Authors' summary slightly amended.] 849

A method is described which is suitable for studying the migration of polymorphonuclear leukocytes *in vitro*. The migration of leukocytes which have engulfed virulent tubercle bacilli is completely inhibited, whereas a similar effect is not produced when avirulent bacilli are taken up.

WAKSMAN, S. A., & LECHEVALIER, H. A. (1949.) Neomycin, a new antibiotic active against streptomycin-resistant bacteria, including tuberculosis organisms.—*Science*. 109. 305–307. 850

This antibiotic is produced by *Streptomyces fradiae*, in media containing peptone or meat extract, glucose and salt, under stationary or submerged culture conditions. It is isolated by the procedures adopted for streptomycin and is soluble in water, thermostable, active against Gram-positive and -negative organisms, especially mycobacteria, but not against fungi. It is active against streptomycin-sensitive and -resistant organisms, is of limited toxicity to animals and is active *in vivo* against Gram-positive and Gram-negative organisms and streptomycin-resistant organisms. At doses of 50–200 units neomycin, per mouse or egg embryo, 50–100% survival was obtained after ten days with *Staphylococcus aureus* (streptomycin-sensitive), *Salmonella schottmülleri* (streptomycin-resistant) and *S. pullorum* (streptomycin-sensitive). Neomycin is bactericidal against *Bact. coli* at 10–25 u. per ml. and to streptomycin-sensitive, -resistant or -dependent strains and is thus biologically and chemically different from streptomycin. Neomycin is more stable than aureomycin and bacteria do not become resistant to it. Its chemical constitution is unknown as it has not yet been obtained in crystalline form.—M. W.

HOWLETT, K. S., JR., O'CONNOR, J. B., SADUSK, J. F., JR., SWIFT, W. E., JR., & BEARDSLEY, F. A. (1949.) Sensitivity of tubercle bacilli to streptomycin. The influence of various factors upon the emergence of resistant strains.—*Amer.*

Rev. Tuberc. 59. 402-414. [English and Spanish summaries, abst. from English summary.] 851

Data were presented on the sensitivity of tubercle bacilli to streptomycin in a series of patients treated with streptomycin for pulmonary TB.

An impressive correlation was observed between the incidence of resistant tubercle bacilli and the type of TB. being treated. Resistant strains have emerged in a high proportion of patients who had frank caseation or cavity in pretreatment roentgenograms. In a group of 56 such patients, treated on the several regimens employed in this study, strains uninhibited by 10 γ of streptomycin per ml. of culture medium eventually occurred in 33 (59%). In contrast (and regardless of the treatment regimen employed), strains uninhibited by 10 γ per ml. or less have occurred thus far in none of 31 patients who had no frankly caseous or cavernous lesions prior to treatment.

CHIN, Y.-C., ANDERSON, H. H., ALDERTON, G., & LEWIS, J. C. (1949.) **Antituberculous activity and toxicity of lupulon for the mouse.**—*Proc. Soc. exp. Biol., N.Y.* 70. 158-162. 852

Lupulon, a fat soluble antibiotic obtained from hops, checked the growth of *Mycobact. tuberculosis* in experimentally infected mice, the number of bacilli present in different organs in those treated being one-quarter the number in the controls. When given intramuscularly, lupulon produced some degeneration of the renal tubules and a mild leucocytic infiltration of the liver, which were not seen in the animals treated orally. The single LD₅₀ was 600 mg. per kg. intramuscularly or 1,500 mg. per kg. orally.—J. A. NICHOLSON.

DESSAU, F. I., YEAGER, R. L., & KULISH, M. (1949.) **A simplified guinea pig test for tuberculostatic agents.**—*Amer. Rev. Tuberc.* 60. 223-227. [Spanish summary. English summary copied *verbatim*.] 853

Because of the necessity for a highly specific test for tuberculostatic agents which could be used with only small quantities of new chemicals, a modification of the classic guinea pig test has been developed. Its execution, accuracy, and purpose have been discussed. The test requires five weeks for completion.

CANTONNET BLANCH, P., CANTONNET BLANCH, H., & PÉREZ SCREMINI, A. (1949.) Las complicaciones ganglionares supuradas de la vacunación BCG Rosenthal. [**Complications of BCG vaccination.**]—*Rev. Tuberc., Urug.* 16. 85. [Abst. in *Amer. Rev. Tuberc.* 60. No. 2. p. 20 of absts., copied *verbatim*. Signed: F. PÉREZ-PINA.] 854

Vaccination with BCG by the subcutaneous

route is known to be followed sometimes by the formation of nodules and fistulous abscesses which may last for several months and which heal in the manner of cold abscesses. Little has been published about the complications of BCG vaccination by Rosenthal's intradermal technique. In a few patients vaccinated intradermally, however, following types of reactions have been observed: (1) local reactions of minor consequence at the site of vaccination; (2) lymphadenopathy in the regional nodes of the vaccination site; (3) distant lymphadenopathy of the mediastinal, inguinal, or supraclavicular nodes. The local reactions consist of macules, papules, and single or multiple abscesses ranging in size from that of a millet seed to that of a small marble. These suppurate and heal with scarring. The regional reactions consist of the enlargement of one or more axillary lymph nodes which may reach the size of a pigeon's egg and contain more than 10 cc. of pus. They generally suppurate and form fistulas which run a chronic course, usually of several months' duration. When they heal the scar has the classic scrofulous character. These lymph node enlargements appear at any time from fifteen days to eight months after vaccination and are not accompanied by any systemic reactions. The pus obtained from the lesions is like that of a cold abscess and in some cases may contain acid-fast bacilli. In most cases, none can be found. In 2 of the 12 cases cited by the authors, mediastinal, inguinal, and supraclavicular lymph node enlargements occurred. The mediastinal enlargement was easily demonstrated in the chest roentgenogram.

MYREN, J. (1948.) Den intrakutane BCG-vaksinasjon. Meddelelse om resultater ved bruk av større doser. [**Intracutaneous BCG vaccination. A communication on the results of larger doses.**]—*Tidsskr. Norske Laegeforening.* 68. 267-269. 855

BCG vaccine, intended for percutaneous administration and having a concentration of about 40 times that of BCG for intracutaneous injection, was inadvertently injected intracutaneously into 66 persons, some babies, some school children and some adults. Although the local reaction was rather violent the ultimate results were satisfactory. All the 66 persons became Pirquet-positive. The results of intracutaneous vaccination of 185 persons on the same day with 0.10 ml. of intracutaneous BCG vaccine were inferior to those obtained in these 66 persons. 70% became Pirquet-positive to Norwegian tuberculin and only 39% to Danish tuberculin.

M. concluded that the dosage of BCG could safely be increased. He accordingly vaccinated 245 persons intracutaneously, using 0.15 ml.

intracutaneous vaccine for children 1-10 years old and 0.20-0.25 ml. for older children and adults. Two months later, Pirquet tests were carried out using both Norwegian and Danish tuberculin, the results being read 48 hours later. When these results were compared with those obtained in 220 persons vaccinated with 0.10 ml. intracutaneous vaccine, it was found that decidedly better results had been obtained with the increased dosage. Taking an infiltration of 3 mm. as a positive reaction there were 20% more positive reactions to Norwegian tuberculin and 14% more positive reactions to Danish tuberculin than had been obtained using the lower dosage.—F. E. W.

McINTOSH, C. W., & KONST, H. (1949.) **Tuberculin production of various strains of *Mycobacterium tuberculosis* var. *bovis*.**—*Canad. J. comp. Med.* 13. 172-176. 856

Three out of 15 old laboratory strains harvested at pH 6.8-7.6 produced a greater amount of P.P.D. than the standard strain which was being employed for tuberculin production. Strains harvested at pH 5.6-6.0 gave low yields of P.P.D. There was no correlation between dry weight of the bacilli and yield of P.P.D. Three out of four recently isolated strains, which had acid final reactions, gave comparatively small yields of tuberculo-protein. The fourth, which was harvested at a neutral pH value, gave a significantly greater yield. There appeared to be a relationship between the final reaction of culture medium and the yield of P.P.D. A suggested explanation is that a considerable portion of the tuberculo-protein adheres to the bacillary bodies in acid medium, but remains in soluble form at a more alkaline level.—R. GWATKIN.

MILLER, J. M., VAUGHAN, J. H., & FAVOUR, C. B. (1949.) **The role of complement in the lysis of leucocytes by tuberculo-protein.**—*Proc. Soc. exp. Biol., N.Y.* 71. 592-597. [Authors' summary copied *verbatim*.] 857

The essential role of complement in the *in vitro* cytolysis of human white blood cells by tuberculin has been demonstrated, using two different systems of complement removal. In this way, the mechanism of *in vitro* tuberculin hypersensitivity has been further elucidated.

TAYLOR, A. W. (1949.) **Observations on the incidence of infection with *M. johnei* in cattle.**—*Vet. Rec.* 61. 539-540. 858

T. examined material from the carcasses of cattle in apparently normal health consigned to the Ministry of Food for human consumption. In a period of four months (Sept.-Dec. 1948) cultures from the ileo-caecal lymph nodes of 243 carcasses were prepared and *Mycobacterium johnei* recovered from 37 (15%). Of these, 154

nodes were from carcasses of lactating cows and 22 (14%) were positive. T. suggests that *M. johnei* may belong to the varied group of organisms which exist as normal inhabitants of the body and which become pathogenic only under certain environmental conditions.—M. W.

SIGURDSSON, B. (1947.) **A specific antigen recovered from tissue infected with *M. paratuberculosis* (Johne's bacillus). IV. Studies on a second, inhibiting substance in the infected mucosa.**—*J. Immunol.* 57. 11-16. 859

In previous studies S. [V. B. 16. 181; & 17. 177, 523.] had suggested that enteric mucosa of cattle with Johne's disease contained a substance capable of inhibiting the fixation of complement in mixtures of the specific antigen and antibody. He now records that the inhibitor was present in the mucosa of all of 13 infected cattle and absent from all of the 13 normal cattle. He has been able to remove that inhibitor by suspending powdered mucosa in saline, adjusting the pH to between 3 and 4, allowing to stand at room temperature for 30 min. and centrifuging, the inhibitor being in the supernatant portion. Strongly antigenic extracts were inhibited to the extent of 14-40%. No anticomplementary activity was observed in the inhibiting extracts.—L. M. M.

DINTER, Z. (1949.) **Untersuchungen über die Spezifität der Haemagglutinationshemmungsprobe beim Schweinerotlauf. [The specificity of the haemagglutination-inhibition test in swine erysipelas.]**—*Zbl. Bakt. (I. Orig.)* 153. 281-284. [English, French & Russian summaries. Abst. from English summary.] 860

Hemagglutination (HA) was produced consistently only by some strains of *Erysipelothrix rhusiopathiae* under certain conditions of cultivation and it was inhibited only by homologous antisera, not by heterologous antisera or normal sera. HA which occurred in low dilutions with some sera and was considered non-specific could not be inhibited by antiserum. If such sera were saturated with fowl red cells the non-specific hemagglutinating factor was bound while the inhibiting one remained free. HA caused by the virus of Newcastle disease could only be inhibited by anti Newcastle disease serum, not by the anti-erysipelas serum or *vice versa*.

BLORE, I. C., VAN ES, L., & OLSON, C., Jr. (1949.) **Reliability of *Erysipelothrix rhusiopathiae*.**—*J. Amer. vet. med. Ass.* 115. 99-102. 861

The viability and virulence of commercially prepared vaccines from six producers over a six-year period were examined. Considerable variation in product acceptability at the expiration date was revealed. The percentage of samples found to be

avirulent varies from 16-48% in the period 1942-47.

[The title is inadequate. The paper is about the viability of the live culture issued for use as a vaccine and injected together with the antiserum.]

—MALCOLM WOODBINE.

ZINSSER, H. H., & WILLIAMS, W. J. (1949.)

Fibrinolysis in Gram-negative bacilli.—*J. Bact.*

58. 501-509. [Authors' summary copied *verbatim*.] 862

Dissolution of fibrin by strains of *Escherichia coli* occurs. This fibrinolytic capacity is separate and distinct from the acid-forming properties of the strains. The fibrinolytic property is more often seen in strains most virulent for mice. The lysis proceeds without significant trypsinlike activity. The process differs from that seen with streptococci in several other important respects: (1) The lysis with coliforms is slower. (2) No cell-free extract was found to have activity. (3) To produce lysis the coliforms are best grown on a high glucose medium. (4) Significant differences in inhibition by trypan blue, lysophosphatides, adenylic acid, cysteine, and two sulfonamides exist.

ROBERTS, R. B., & ALDOUS, E. (1949.) **Recovery from ultraviolet irradiation in *Escherichia coli*.**

—*J. Bact.* 57. 363-375. [Authors' summary slightly amended.] 863

Escherichia coli, strain B, after ultraviolet irradiation, may survive to develop colonies or not, depending on certain minor changes in their subsequent treatment. Changes in survival level by as much as a factor of 100 have been observed. Transitions from "single-hit" to "multiple-hit" survival curves are also found. This effect should be recognized and controlled if errors in radiation experiments and their interpretation are to be avoided. A study of the conditions for recovery from this "radiation sickness" gives further evidence for a cell poison hypothesis. According to this hypothesis, the primary effect in the killing of strain B by ultraviolet rays is the production of a poison within the cell. Under certain conditions this poison can be inactivated or removed and the cell remains viable. Under other conditions the poison selectively inhibits the mechanism of cell division and unbalance is created between division and growth, a filament or "snake" is produced, and the cell finally dies. The killing of strain B by X-rays and B/r by ultraviolet rays is due to a different mechanism as no "snakes" are produced and no recovery is observed.

KELNER, A. (1949.) **Photoreactivation of ultraviolet-irradiated *Escherichia coli*, with special reference to the dose-reduction principle and to ultraviolet-induced mutation.**—*J. Bact.* 58.

511-522. [Author's summary copied *verbatim*.] 864

Visible light of wave lengths under 5,100 Å will cause the recovery of microbial cells from ultraviolet-induced injury which would otherwise be fatal. Light-induced recovery, or photoreactivation, occurs in at least four diverse species, *Escherichia coli* B/r, *Streptomyces griseus* ATC 3326, *Penicillium notatum*, and *Saccharomyces cerevisiae*.

In *E. coli* B/r the ultraviolet dose-survival curves for suspensions kept dark after irradiation, and for suspensions photoreactivated, have in general similar shapes. From the similarity in shape of the curves there was evolved the *dose-reduction principle*—the effect of a constant amount of reactivating light on survival in a suspension irradiated with varying amounts of ultraviolet light is the same as if it decreased the effective ultraviolet dose by a constant factor. For *E. coli* B/r this means that the amount of reactivating light used in one experiment reduced the dose of ultraviolet light effective in killing cells by 60 per cent.

E. coli B/r cells incubated in broth at 37°C, in the dark, after ultraviolet irradiation, lost their ability to be photoreactivated. The ability to recover decreased exponentially with incubation time, becoming zero after 2 to 3 hours of incubation.

Induced mutants occur in photoreactivated *E. coli* B/r cells. At the ultraviolet doses used, reactivating light apparently reduced the frequency of mutants characterized by phenotypic expression within a few minutes after irradiation (zero-point mutants) but had little or no effect on mutants characterized by phenotypic expression only after a prolonged period of incubation. The possible significance of these data in the light of the dose-reduction principle is discussed.

KNOX, W. E., AUERBACH, V. H., ZARUDNAYA, K., & SPIRITES, M. (1949.) **The action of cationic detergents on bacteria and bacterial enzymes.**

—*J. Bact.* 58. 443-452. [Authors' summary copied *verbatim*.] 865

Several cationic detergents have been shown to kill *Escherichia coli* parallel with the inhibition of certain metabolic reactions of these cells. Other reactions persist in the presence of the lethal amounts of detergents. The detergents produce these effects of killing and inhibition proportional to the detergent-bacterial ratio, and not to the detergent concentration.

Escherichia coli possess certain enzymes which in cell-free forms can be inhibited by the detergent-protein ratios which are bactericidal for the intact cells. One of these, the lactic acid oxidase, which does not require coenzyme I and which reacts

directly with oxygen, is described. The specific inhibition of such detergent-sensitive enzymes can account for the metabolic inhibition, cell death, and increased permeability observed in bacteria with bactericidal amounts of cationic detergents.

FRITZSCHE, K. (1949.) Experimentelle Untersuchungen über die Infektiosität des Bakterium *abortus equi* für kleine Versuchstiere. [Experiments on small animals with *Salmonella abortus-equi*.]—*Tierärztl. Umsch.* 4. 145–149. 866

Filtrates of cultures from seven strains of *S. abortus-equi* were non-toxic when injected intraperitoneally into mice and g. pigs. Cultures heated at 70°C. for one hour were only slightly toxic (three out of seven strains). In g. pigs inoculated subcutaneously with 1 ml. of a broth culture there was local abscess formation and generalized infection when they were killed 14 days later and examined P.M.: no deaths occurred (seven strains, one g. pig each). Serial passage of a mixed strain in g. pigs, rabbits and mice suggested a slight increase in virulence in mice after six passages. Parenteral or oral administration of culture to mice produced infection in 2–17 days. A few mice survived and these remained "carriers" for at least a month. Rabbits and g. pigs could not be infected *per os*.

The course of the infection in g. pigs inoculated subcutaneously and killed 14 days later (local abscess and secondary lesions in the liver) may be sufficiently typical to be of value in diagnosis.—E. G. WHITE.

SCHOOP, G. (1949.) Die Bekämpfung der Gärtnerinfektion bei Silberfüchsen. [Control of *Salmonella* infection in silver foxes.]—*Dtsch. tierärztl. Wschr.* 56. 85–87. 867

In view of the fact that *Salmonella* infection in silver foxes is often secondary to undetected distemper, *S. vaccinated* foxes, 6–8 weeks old, with 1 ml. Behring distemper vaccine and 6–8 ml. serum. Losses were 54% among unvaccinated foxes; among the vaccinated animals they were only 3–7%.—R. ROSS-RAHTE.

LILLENGEN, K. (1947.) Typindelning av *Salmonella typhi* murium medelst bakteriofager. [Typing of *Salmonella-typhi murium* by means of bacteriophage.]—*Svensk Vet. Tidskr.* 52. 167–179. [Abst. from English summary.] 868

Using 36 different bacteriophages the author has endeavoured to classify 384 strains of *Salm. typhi-murium*, isolated from man and different kinds of animals in several European countries, the U.S.A., the Argentine and South Africa. With a combination of 11 of the phages used or tested, 365 of the strains examined could be divided into 21 types. Strains related in epidemiological or

epizootological respects and also strains isolated from the same individual reacted to the same type of phage. Representatives of all the strains of the organism were examined after passages through mice and the types were then found to be constant. Some of the types set up are based on the examination of only a few strains; further experience regarding the stability or uniformity of these types is required.

RICE, C. E., & GWATKIN, R. (1949.) Studies in pullorum disease. XXIV. A comparison of titers obtained by indirect complement fixation and agglutination methods for chicken sera.—*Canad. J. comp. Med.* 13. 165–172. 869

The titres of chickens infected with the variant (XII₂) form of *S. pullorum* to the indirect complement-fixation, the whole blood and tube agglutination methods were roughly similar. The whole blood test appeared to be the most sensitive, the tube test the least sensitive. Preliminary results with a small number of sera prepared against antigenically related organisms indicated that the indirect complement-fixation test might possibly be useful as an aid in differentiating cross activities from specific pullorum reactions.

—P. J. G. PLUMMER.

GRAZZINI, F., & LAPI, L. (1947.) Sulla diagnosi delle infezioni da brucelle con la reazione di agglutinazione. [Diagnosis of *Brucella* infection by the agglutination reaction.]—*G. Batt. Immun.* 36. 385–400. [English, French and German summaries.] 870

The authors refer to well known factors in testing human sera for the diagnosis of infection with *Br. abortus* and *Br. melitensis* in the S and R phases. The elimination of reactions caused by infection with certain other diseases by heating the serum to be tested, is referred to. Formalin-killed suspensions of the organism in the R phase lose much of their agglutinability but gain in specificity, so that reactions at lower titres indicate infection. Further research is required to ascertain if brucella suspensions killed by other agents such as phenol will prove even more specific in the diagnosis of R infections.—I. W. JENNINGS.

JURADO, F. R. (1948.) La prueba opsonocitofágica en la brucelosis bovina. [The opsonocytophagic test for brucella infection in cattle.]—*Rev. Med. vet., B. Aires.* 30. 149–173. [English & French summaries. Abst. from English summary and conclusions.] 871

The purpose of this work has been to study the significance of the opsonocytophagic test in bovine brucellosis. This paper includes comparative observations between the opsonocytophagic test and the agglutination reaction in connection with bacteriological findings. 106 animals were

used, divided into six groups including immune, infected and susceptible animals. The immune group consisted of heifers vaccinated, when they were between 3 and 8 months old, with officially controlled vaccine of *Brucella abortus*, strain 19. The group of susceptible animals was made up of heifers between 16 and 20 months old with several negative agglutination tests.

It was found that: (1) Infected cows, eliminating brucella in the milk and with a high agglutination titer, gave a corresponding phagocytic reaction. (2) Heifers vaccinated during calthood with strain 19, without post-vaccinal agglutination titers, gave negative phagocytic reactions. (3) Heifers vaccinated during calthood with strain 19, and giving variable post-vaccination titers, gave also variable opsonocytaphagic reactions. (4) The results of the agglutination test and the opsonocytaphagic reaction were in agreement. The opsonocytaphagic test was not useful as a test of immunity in bovine brucellosis.

EHRLICH, C. (1947.) Vorschläge für eine Neuregelung der Bekämpfung des seuchenhaften Verkälbens. [Plans for renewed control of contagious abortion in cattle.]—*Dtsch. tierärztl. Wschr.* 54. 247-250. 872

The author considers that live brucella vaccines are of value and criticizes their prohibition by law in Germany in 1936. He urges the use of the strain 19 vaccine and the use of general control measures on uninfected farms.—M. LATZKE.

MCCULLOUGH, N. B., EISELE, C. W., & BEAL, G. A. (1949.) Oral administration of killed *Brucella* to man.—*Publ. Hlth Rep., Wash.* 64. 1613-1616. [Authors' discussion slightly amended.] 873

It is apparent that prolonged feeding of killed *Brucella* to healthy individuals, even with maximum total doses of 49 billion organisms, failed to produce significant agglutination titers or dermal sensitivity. This is in accord with the results of previous workers. The maximal doses fed, but not the smaller doses, stimulated demonstrable opsonic activity in nine individuals. Six of these men were in group III B which was regarded as having pre-existing latent antibody present, and hence might be expected to respond to a smaller antigenic stimulus than the other experimental subjects. The dosage levels selected were those which we believe might approximate natural conditions obtaining in pooled market milk as well as in milk drawn primarily from heavily infected herds.

WAGNER, R. R. (1949.) Non-specific inhibition of the lecithinase activity of type A *Clostridium welchii* toxin.—*J. Bact.* 58. 491-496. [Author's summary copied verbatim.] 874

The serums of normal rabbits, guinea pigs, and mice produce a slight but definite inhibition of the lecithinase activity of type A *Clostridium welchii* toxin. The reaction is not affected by normal human serum. Both normal rabbit serum and lecithovitellin inhibit the hemolytic action of the toxin; the effect of normal rabbit serum is more prolonged. The nonspecific serum inhibitor is distinguished from antibody by its differential heat lability. In the presence of subinhibitory doses of normal rabbit serum, the marked resistance to heat of the lecithinase is lost. The possible relation of these effects to the formation of an enzyme-inhibitor complex is discussed. Neither normal rabbit serum nor lecithovitellin diminishes the lethal action of the crude toxin.

SZYFRES, B., TRENCHI, H., & ABARACON, D. (1948.) Intoxication botulinique des canards. [Botulism in ducks.]—*Bull. Off. internat. Epiz.* 29. 431-437. 875

Although there is a record of botulism in man in the Argentine in 1922 there appear to be no references to the condition in domestic stock in South America. The authors isolated a non-proteolytic strain of *Cl. botulinum* from the heart blood of a duck on a poultry farm in the Montevideo province of Uruguay where losses had occurred for two years past. Deaths coincided with the fall of the water level in an artificial lake during the hot season and a total of 170 out of 200 ducks had died. There was no record of deaths among fowls on the farm. Affected ducks had paralysis of the feet and wings. Not all affected ducks died.

The organism was identified by its morphological, cultural and biochemical characters and by inoculation or feeding of culture or toxin to g. pigs, mice and ducks. Mice died within 72 hours after intraperitoneal inoculation of 0.25 ml. of a 1:10,000 dilution of a 14-day Tarozzi broth culture. The same dose of a 1:100,000 dilution did not cause death. Affected mice had dyspnoea and the only lesion found P.M. was intense pulmonary congestion. A duck given 8 ml. of culture filtrate *per os* developed typical symptoms in 24 hours and died in 48 hours. Doses of 0.1 and 0.25 ml. of toxin killed ducks in 48-72 hours when given parenterally. The disease was produced in chicks by doses of 10 ml. of culture *per os*; smaller doses were ineffective.

[No immunological work was carried out and the type of toxin produced was not determined.]

—E. G. WHITE.
SOMPOLINSKY, D. (1948.) En enzooti förärsaget af *Clostridium carnis* hos mink. [Enzootic due to *Clostridium carnis* in mink.]—*Skand. Vet-Tidskr.* 38. 506-519. [Abst. from English summary.] 876

S. isolated *Cl. carnis* from kidney tissue of mink in Denmark. Twenty animals were affected and in most of them death occurred in a few hours. P.M. examinations revealed septicaemic changes and renal infarcts. The morphological, cultural and pathogenic characters of the organism are described.—J. SCARNELL.

McAULIFF, J. L., & PHILLIPS, W. V. (1947.) Use of sodium sulfamerazine in foot infections in cattle.—*Vet. Med.* 42. 374-376. 877

This is a clinical article and the authors assumed that the condition is caused by *Fusiformis necrophorus*. In 114 of 118 cases a single intravenous dose of 60 g. sodium sulphamerazine is stated to have caused rapid improvement and complete recovery within 3-5 days. Thirty-one chronic cases were treated: after appropriate surgical attention each received an intravenous dose of 60 g. sodium sulphamerazine. In addition certain of them, in which there was joint infection, were given orally 0.25 grain per lb. body weight twice daily for two or three days; the wound and cavity were packed with sodium sulphamerazine powder and a gauze dressing applied. In some cases the joint cavity was irrigated for four days with a 10% solution of sodium sulphamerazine. Twenty-five animals recovered completely in 2-3 weeks, but there was no appreciable improvement in the other six.

Details are given of recovery after similar treatment in other, less severe cases.—J. O. L. K.

NICKERSON, W. J. [Edited by] [Ph.D., Assistant Professor of Botany, Wheaton College, Mass.]. (1947.) *Biology of pathogenic fungi*. Vol. VI. pp. xix + 286. Waltham, Mass.: The Chronica Botanica Co. London: Wm. Dawson & Sons, Ltd. \$5.00. 878

In this interesting and stimulating book, the several chapters of which have been written by different authors, excellent contributions are made on the general biology of some of the fungi pathogenic for man. The subjects discussed cover a wide field, forming a valuable exposition of present knowledge, and indicate the lines of possible future advancement. Chapters are devoted to discussion on the relationship between the nutritive requirements and the pathogenicity of fungi; the pathogenicity of the *Torulopsidoideae* with special reference to *Torulopsis neoformans*; a general account of Chromoblastomycosis; a review of the work on the growth requirements of *Pityrosporum ovale*, a fungus which needs a fatty substance for continued growth; the biology of *Coccidioides*; a description of coccidioidomycosis, the use of skin testing antigens for diagnostic and epidemiological studies, and most interesting observations on possible rodent reservoirs of the

disease; the recent work of the Italian school of mycopathology; a discussion on the action of sulphonamides and antibiotic agents on pathogenic fungi; a general account of the geographical distribution of fungus diseases; the general metabolism of pathogenic fungi; the nutrition and metabolism of pathogenic fungi including the physico-chemical factors involved in growth; an account of the metabolic products of pathogenic fungi; reviews of recent work on the lipoids of fungi with special reference to the lipoids of *Candida albicans* and *Blastomyces dermatitidis*; and the respiration of pathogenic fungi with special reference to the yeast-like fungi and the dermatophytes.

Eminent mycologists have taken part in the authorship. Numerous references are given at the end of each chapter, and the book is provided with three useful indexes.—J. J. BULLEN.

EMMONS, C. W., MORLAN, H. B., & HILL, E. L. (1949.) *Histoplasmosis in rats and skunks in Georgia*.—*Publ. Hlth Rep., Wash.* 64. 1423-1430. [Authors' summary copied *verbatim*.] 879

H. capsulatum was isolated from seven brown rats (*R. norvegicus*), four roof rats (*R. rattus*) and five spotted skunks (*S. putorius*) in southwestern Georgia.

These 16 strains resemble each other but differ from most strains of human, canine, and rodent origin in the paucity of macroconidia and great abundance of microconidia. They are pathogenic for mice, and all have been re-isolated from experimentally infected mice on blood agar in the typical yeast-like form of growth.

LAGERREVA, M. G. (1946.) [Epizootic lymphangitis in horses. (Symposium).]—*Veterinariya, Moscow*. 23. No. 10-11. pp. 17-22. 880

A description of the clinical types of epizootic lymphangitis. L. claimed that treatment with "ammargen" [composition not stated] yielded cures. She also stated that injection into local lesions with a mixture of camphor, phenol and alcohol was even better.—F. A. A.

SUTHERLAND, A. K., SIMMONS, G. C., & KENNY, G. C. (1949.) *Bovine leptospirosis. Three outbreaks in calves in Queensland*.—*Aust. vet. J.* 25. 197-202. 881

Three outbreaks in different parts of Queensland involving some 30 calves are described. *Leptospira* were demonstrated by dark field examination of kidney and urine, but were not found in blood. The leptospira were cultured in Schuffner medium and when transmitted to g. pigs produced a thermal reaction in 5-7 days. The g. pigs did not succumb to infection; those killed 5-30 days after inoculation usually had necrotic foci in the liver. Sera from a calf in one

outbreak and from g. pigs inoculated with the leptospira agglutinated *L. pomona* to high titre, but yielded no significant agglutination with the other strains of *Leptospira* known in Australia, namely, *L. icterohaemorrhagiae*, *L. australis* A, *L. australis* B and *L. mitis*.

Calves under three months of age were most susceptible. Cardinal signs were: sudden appearance in herd, high incidence of infection, high death rate and haemoglobinuria. P.M. findings were similar to those of *Babesia* infection, i.e., anaemia and jaundice.

Dark-field examination for leptospira of the deposit from urine centrifuged at 3,000 r.p.m. for 45 min. in the dark field was found to be a useful diagnostic aid. Organisms were demonstrated readily in kidney sections stained by the Levaditi method.

The disease was transmitted to calves by inoculation with tissues from natural cases, with infected g. pig tissues and with cultures. The authors support the suggestion that pigs, as carriers, are possibly concerned in the epidemiology of the disease.—R. BAIN.

BRION, A., & BERTRAND, M. (1948.) Existence en France de la néphrite leptospirosique du chien à *Leptospira canicola*. [*Leptospira canicola* infection in France.].—*C. R. Soc. Biol. Paris*. 142. 1112-1113. 882

Acute uraemic nephritis of obscure or doubtful origin was studied in dogs. G. pigs were inoculated and in dogs which survived longer than 8-10 days agglutination tests were of use. In one case the agglutination titre for both *L. icterohaemorrhagiae* and *L. canicola* was 1:1,000. Sections of kidney were examined and numerous *Leptospira* were demonstrated in the tubular epithelium and also in the interstitial tissue of the kidneys.—G. V. LAUGIER.

BERNKOPF, H. (1948.) Experimental leptospirosis in chickens.—*Proc. Soc. exp. Biol., N.Y.* 67. 148-149. 883

As nothing was known about the susceptibility of fowls to certain leptospira, B. inoculated 12 fowls with a strain from Palestine, infecting both cattle and human beings. The organisms were cultivated from the heart blood on the fourth day after inoculation in one fowl and on the ninth day in another. Five fowls given culture *per os* developed specific antibodies at titres of 1:800 to 1:3,200.—D. LUKE.

CASPER, J., & REIF, L. (1946.) [*Leptospirosis* (spirochetal jaundice) in man in Palestine. Pathological anatomical examinations.].—*Harefuah*. 30. 113-117. [Abst. from English summary.] 884

A pathological anatomical examination of five human cases of leptospiral jaundice in Palestine is

described. Simultaneously cases of jaundice in cattle occurred from which a leptospira, different from the varieties described so far, was cultivated. Leptospira were not cultivated from the human cases, but the high agglutination titer of the patients when convalescent indicated that the organisms from the human and bovine cases were identical. Morphologically also, the leptospira were identical.

Most of the human beings infected had come into very close contact with infected cattle.

The clinical picture and the pathological anatomical findings resembled those of Weil's disease. In all cases leptospira were found in the kidney, and in some cases also in the liver, intestines, cardiac muscle, testes, and adrenals. Although there was jaundice and uremia in some of the cases, there were no marked lesions in the liver and kidneys. This seemed to be characteristic of the infection.

The lesions in cattle that had died of leptospirosis resembled those in the human patients.

PADERSKY, B. (1946.) [*Human leptospirosis in Palestine*.].—*Harefuah*. 30. 117-121. [Abst. from English summary.] 885

From the clinical standpoint, all of the cases had much in common, above all, sudden, stormy onset with conjunctivitis; severe muscle pains, with jaundice in five cases; one case without jaundice; and one case with jaundice only during the first days of the illness. The jaundice then disappeared and the fever continued for several weeks. In most of the cases there was nephritis with retention of urea.

Every case which is characterized by this clinical picture, particularly the stormy onset with conjunctivitis, should be considered as suspicious of leptospirosis. In Palestine the bovine organism is probably the agent.

MORNET, P., ORUE, J., & DIAGNE, L. (1947.) Permanence *in vivo*, dans le tissu conjonctif souscutané, du virus péripneumonique de culture et vaccinations différées, avec vaccins vivants. [*Persistence of the organism of bovine contagious pleuro-pneumonia in subcutaneous tissues*.].—*Bull. Acad. vét. Fr.* 20. 467-471. 886

In cattle vaccinated with attenuated cultures of the organism of bovine contagious pleuro-pneumonia late reactions sometimes occur, the reasons for which are not understood. The authors observed a violent and fatal reaction of this nature occurring at the site of vaccination when the animal was inoculated a few weeks later with another living vaccine—anthrax vaccine or rinderpest vaccine.—A. MAYR-HARTING.

TULASNE, R. (1949.) Existence of L-forms in common bacteria and their possible importance.

[Correspondence].—*Nature, Lond.* 164. 876–877. 887

Colonies of L-organisms were obtained from *Proteus vulgaris*, cultured on serum agar in the presence of a high concentration of penicillin. These microcolonies were found to be desoxyribonucleic material and to have the dimensions and appearance of nuclei of normal *Proteus* cells. On penicillin-free medium the L colonies soon reverted to the normal forms. The author considers L organisms to be resistant forms.—A. M.-H.

HAMRE, D. (1949.) The effect of ultrasonic waves upon *Klebsiella pneumoniae*, *Saccharomyces cerevisiae*, *Miyagawanella felis*, and influenza virus A.—*J. Bact.* 57. 279–295. [Author's summary copied verbatim.] 888

Within the limits of our experiments, it was found that the distance between the crystal and the bottom of the container, the age of the culture being treated, and the concentration of the cells being treated had no effect upon the mortality of *Klebsiella pneumoniae* during ultrasonic treatment. The mortality of *K. pneumoniae* was higher when the cell suspension was treated in a cellophane-bottomed container than when a glass container was used. The volume of liquid being treated was important because a deep layer of liquid was not efficiently cooled. A decrease in the amplitude of the ultrasonic waves resulted in a decrease in the mortality of *K. pneumoniae*. The maximum effect upon mortality was obtained with the highest energy output of which our apparatus was capable, i.e. 765 watts. A higher mortality of *K. pneumoniae* was obtained when the cells were suspended in broth than in 0.85 per cent sodium chloride or in buffer solution. However, when 0.002 per cent sorbitan monooleate was added to the saline to give the same surface tension as broth, the mortality of *K. pneumoniae* was the same as it was in broth suspensions.

See also absts. 938 (aureomycin, chloromycetin in chick embryos with psittacosis); 940 (bacterial lysis); 947 (lymphadenitis); 951 (glanders); 961 (streptococcal enzyme); 1070 (bactericides); 1080 (from blood stream); 1090 (semen in growth inhibition of *Staph. aureus*); 1109 (in sewage); 1114 (penicillin and bull semen); 1131 (identification key); 1132 (culture preservation); 1133 (desiccation); 1134 (sectioning in situ); 1135 (measuring); 1161 (ruminal flora); 1163 (moulds on optical instruments); 1166 (N. Rhodesia, report); 1168 (Brit. W. Indies, report); 1169 (textbook); 1170 (history of TB., book).

DISEASES CAUSED BY PROTOZOAN PARASITES

HEWITT, R. I., GUMBLE, A., KUSHNER, S., SAFIR, S. R., BRANCONE, L. M., & SUBBAROW, Y. (1949.) Experimental chemotherapy of trypanosomiasis. I. Effect of *p*-phenylene diguanidine and related compounds against experimental infections with *Trypanosoma equiperdum*.—*J. Pharmacol.* 96. 305–314. 890

As a trypanocide against *T. equiperdum* in mice, *p*-phenylene diguanidine was less effective than arsenic compounds, Bayer 205 or stilbamidine when administered intraperitoneally, but its interest and possible importance lay in the fact

The mortality of *Saccharomyces cerevisiae* was about the same in broth suspensions and in buffer suspensions, and the difference between the mortality in broth suspensions and in saline suspensions was not so great as that observed with *K. pneumoniae*. The yeast was somewhat more resistant to disruption by ultrasonic waves than was *K. pneumoniae*. Electron micrographs of *K. pneumoniae* and *S. cerevisiae* showed the ruptured cells and cell walls.

Miyagawanella felis (the agent of feline pneumonitis) was inactivated by ultrasonic energy after 20 minutes' treatment. An increase in the amount of agent was observed after 10 minutes' treatment, probably due to the dispersion of aggregates of the elementary bodies. Ultrasonic energy also inactivated influenza virus A (PR8 strain). In none of the ultrasonic experiments conducted were 100 per cent of the cells or virus destroyed.

PIJPER, A. (1949.) Evidence that amputation of bacterial flagella does not affect motility.—*Science.* 109. 879–880. 889

Using the sunlight dark ground technique, P. demonstrated that *Salmonella typhi*, grown in suitable broth, exhibited a long thin tail in fast movement. This tail might untwist itself into wavy threads, which floated away. He regarded the tails as twisted bundles of bacterial flagella. If these flagella were motor organs, then the tail would be a motor organ. When grown in unsuitable broth the organism did not have a tail, yet was motile. Its motility did not depend on the presence of a tail: it could propel itself without outside motor organs. In a culture in which every individual had a good tail, the tails were amputated when the culture was shaken vigorously for 15 min., after which, though all tails had disappeared, motility remained unimpaired.

—W. R. BETT.

See also absts. 938 (aureomycin, chloromycetin in chick embryos with psittacosis); 940 (bacterial lysis); 947 (lymphadenitis); 951 (glanders); 961 (streptococcal enzyme); 1070 (bactericides); 1080 (from blood stream); 1090 (semen in growth inhibition of *Staph. aureus*); 1109 (in sewage); 1114 (penicillin and bull semen); 1131 (identification key); 1132 (culture preservation); 1133 (desiccation); 1134 (sectioning in situ); 1135 (measuring); 1161 (ruminal flora); 1163 (moulds on optical instruments); 1166 (N. Rhodesia, report); 1168 (Brit. W. Indies, report); 1169 (textbook); 1170 (history of TB., book).

that when given *per os* daily for several days it was effective. Related guanidines had no advantage over *p*-phenylene diguanidine.—R. MARSHALL.

WILSON, E. J., & WORMALL, A. (1949.) Studies on suramin (antrypol: Bayer 205). 7. Further observations on the combination of the drug with proteins.—*Biochem. J.* 45. 224–231. [Authors' summary slightly amended.] 891

A further study has been made of the combination of the trypanocidal drug suramin with a variety of proteins. Suramin-protein complexes are usually readily precipitated by the addition of

dilute acid, the pH for optimum precipitation depending on the relative amounts of the drug and the protein. Repeated precipitation by acid followed by solution at pH 7.5 does not reduce the suramin content of the precipitated complexes. Considerable amounts of suramin become firmly attached to proteins such as the serum proteins and crystalline egg albumin at pH 7.5, but much more is bound by the protein in acid solutions, particularly when the pH is below 6. The absence of suramin from the red cells of animals injected with the drug is due to the inability of the drug to pass through the cell membrane. Suramin readily combines with the proteins of haemolysed red cells. Suramin injected intravenously as a complex with rabbit serum proteins, or with egg albumin, is not retained longer in the blood than is the injected free drug. The blocking of the free amino groups of proteins by the action of di-2-chloroethylsulphone does not reduce the capacity of the proteins to combine with suramin. Suramin does not react with the thiol groups of cysteine or proteins.

RUBIN, B. A. (1948.) **An *in vitro* assay for trypanocidal activity.**—*Yale J. Biol. Med.* 20. 881-893. 892

T. equiperdum proved to be a suitable test organism since the *in vitro* assay for trypanocidal activity could be made to correspond to the *in vivo* conditions. R. describes factors—including temperature, surface-volume ratio, pH, osmotic pressure, inoculum and sterility precautions—which influence the growth-rate of the protozoan in the culture medium; the significance of the quantitative assay for trypanocidal agents can therefore be more truly estimated.

Other methods of testing "protozoa-static" drugs are compared and discussed.—F. S. McC.

HARVEY, S. C. (1949.) **The carbohydrate metabolism of *Trypanosoma hippicum*.**—*J. biol. Chem.* 179. 435-458. 893

H. found that, regarding its metabolism, *T. hippicum* resembles *T. evansi* and *T. equiperdum*. Both glucose and glycerol were quantitatively oxidized to pyruvic acid by *T. hippicum*; anaerobically glucose was converted to glycerol and pyruvic acid. Fractionation of phosphorylated intermediates indicated that the predominant organic phosphorus compounds were triose phosphates, glycerophosphates, and glucose-6-phosphate. The presence of hexokinase was indicated by an appreciable oxygen uptake and specific enzymatic analyses also confirmed the presence of adenosinetriphosphatase, adolase, triose phosphate dehydrogenase with coupled oxidation-reduction, glycerol and glycerophosphate dehydrogenases, and an alkaline phosphatase.

Homogenates of the trypanosomes were also tested for lactic dehydrogenase, cytochrome oxidase, succinic dehydrogenase, and malic dehydrogenase, but none of these enzymes were demonstrated by the various methods used. The catalase activity was low. No significant differences were found when an oxophenarsine-resistant strain of *T. hippicum* was compared with the normal strain.—M. L. CLARKE.

ZAVAGLI, V., & SANFILE, V. (1949.) **Procedimenti diagnostici nelle tricomoniassi del bestiame. [Method of diagnosis of *Trichomonas* infection in cattle.]—*Zooprofilassi*. 4. No. 1. pp. 1-21. [French summary.] 894**

The authors review the various methods of diagnosis of trichomoniasis in cattle, and claim successful results with the complement-fixation test. They recommend it particularly as an aid to the diagnosis of doubtful cases.—M. L. CLARKE.

MORGAN, B. B. (1948.) **Studies on the precipitin and skin reactions of *Trichomonas foetus* (Protozoa) in cattle.**—*Jour. Cell. and Comp. Physiol.* 32. 235-246. [Author's summary slightly amended.] 895

Fourteen different antigens of *Trichomonas foetus* were prepared for skin tests and precipitin studies. The antigens included formamide extracts; Coca extracts; proteins obtained by trichloroacetic acid precipitation; polysaccharid extracts; ether or acetone preparations, mechanically disintegrated trichomonads, bovine trichomonad pyometra fluid and filtrates of *T. foetus* cultures. The various antigens were tested against the sera of naturally trichomonad infected cows and bulls, of cows injected with living or formalin-killed trichomonads either intravenously or intramuscularly, of cows artificially infected with *T. foetus*, and of normal cows and bulls, rabbits vaginally infected with *T. foetus*, rabbits injected intravenously, intramuscularly or intraperitoneally with trichomonads, rabbits injected with the trichloroacetic acid precipitated antigen and normal rabbits and with guinea pigs. Certain antigens were negative to precipitin tests with immune and normal sera, others were negative to the immune sera but were positive to the control sera while other antigens reacted with both the immune and normal sera. All of the intracutaneous tests were negative for any skin reaction.

WICKWARE, A. B. (1949.) **Studies on experimental *Eimeria tenella* infection in chickens fed dietary supplements.**—*Canad. J. comp. Med.* 13. 229-237. 896

The percentage of eggs hatched from pullets fed a green food supplement was higher than the percentage of eggs hatched from those not given this supplement, but the chicks from the former

group were no more resistant to coccidiosis than those from the latter group. It was concluded that vitamin A plays little if any part in inducing resistance to coccidial infection.—R. GWATKIN.

RIGDON, R. H., & RUSKIN, A. (1949.) **Lethal effects and electrocardiographic changes produced by quinine dihydrochloride in malaria-infected monkeys.**—*J. Lab. clin. Med.* **34**. 1109-1117. [Authors' summary copied *verbatim*.] **897**

Monkeys with a severe anemia resulting from *P. knowlesi* infection succumb to a smaller dose of quinine given intravenously than normal animals or those with a less severe anemia.

The electrocardiographic changes following equivalent doses of quinine in malaria-infected monkeys follow the same pattern as in normal monkeys but show evidence of greater cardio-depression.

DONATIEN, A., GAYOT, G., & RAMPON, L. (1949.) **Remarques sur la fréquence annuelle et saisonnière, le traitement et la prophylaxie des piroplasmoses bovines en Algérie. [Seasonal occurrence and treatment of bovine piroplasmosis in Algeria.]**—*Arch. Inst. Pasteur Algér.* **27**. 131-133. **898**

The statistics of outbreaks theileriasis, babesiasis and anaplasmosis during the years 1945-48

See also *absts.* **951** (dourine); **1119** (trichomoniasis); **1171-1172** (books, protozoology).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

FLÜCKIGER, G. (1948.) **I principi moderni di profilassi nella afta epizootica. [Modern principles of foot and mouth disease prevention.]**—*Zooprofilassi*. **3**. No. 5. pp. 14-21. [Abst. from English summary.] **901**

F. states that animals that have recovered from F. & M. disease are the chief source of infection. [There is no convincing evidence that there is a carrier state in F. & M. disease and it certainly is not the case that animals that have recovered are the chief source of infection in new outbreaks.] Carriers can be eliminated by slaughter ("stamping out" method).

The Vallée, Schmidt, Waldmann aluminium-hydroxide vaccine is an efficient prophylactic, by which susceptible animals can be safely immunized for months. By proper application of such a vaccine carefully prepared, F. considers that whole countries could be protected from this disease and existing foci could be controlled. Success can only be achieved if the vaccine is applied according to an official government plan, all the necessary veterinary police measures being simultaneously carried out.

There is no risk of spread of the infection by

are tabulated and the yearly and seasonal variations in incidence are discussed.

Cases of theileriasis occur between the middle of May and the end of August. *B. bigemina* infection occurs throughout the year, but is not common. *B. berbera* infection occurs at all seasons of the year and frequently in July and August. Anaplasmosis is commonest in the spring. The influence of these findings on control measures is discussed.—M. C.

MOHLER, W. M., EICHHORN, E. A., & ROGERS, H. (1949.) **Complement-fixation test for serum diagnosis of bovine anaplasmosis.**—*Vet. Med.* **44**. 155-156. **899**

The technique is described for the diagnosis of anaplasmosis in cattle by means of the complement-fixation test. A total of 10,198 blood samples were tested, and the reactions proved very useful for the detection of carrier animals.

—M. L. CLARK.

ADAMS, F. H., COONEY, M., ADAMS, J. M., & KABLER, P. (1949.) **Experimental toxoplasmosis.**—*Proc. Soc. exp. Biol., N.Y.* **70**. 258-260. [Authors' summary copied *verbatim*.] **900**

The effectiveness of certain of the sulfonamides and the ineffectiveness of certain antibiotics in suppressing toxoplasmosis in the chick embryo has been demonstrated. Congenital toxoplasmosis was produced in the guinea pig.

properly vaccinated animals that have never had F. & M. disease and they can safely be transported even through infected countries. Quarantine measures against such animals are no longer necessary, especially if they come from clean districts.

MÜSSEMEIER, F. (1949.) **Die Maul- und Klauen-seuche und ihre Bekämpfung. [The control of foot and mouth disease.]**—*Mh.-Vet. Med.* **4**. 81-88. **902**

The author summarizes our present knowledge of F. & M. disease with special emphasis on control measures. As M. believes that animals can transmit the disease before clinical symptoms appear and up to a year after apparent recovery, he considers a combination of slaughtering, vaccination and strict segregation measures to be most effective. All cattle in an area 10 km. around the infected premises are vaccinated and the segregation measures as provided by German law are enforced until the vaccination takes effect or until nine days after the last affected animal has recovered.—R. ROSS-RAHTE.

HENDERSON, W. M., & ANDREWES, C. H.

[Speakers]. (1949.) **Discussion: the significance of strain differences in virus prophylaxis.** [Abridged.]—*Proc. R. Soc. Med.* **42.** 517-522. **903**

Vaccine prophylaxis in F. & M. disease and in influenza is discussed.

Besides major immunological differences, which divide the F. & M. disease virus into three types, variants within one type occur and are obstacles for the control of the disease by prophylactic immunization. It has been found that for three variant strains of the same type, complement fixation, serum neutralization and immunizing power go parallel and are strongest with the homologous strain. For the preparation of vaccines the selection of suitable strains and continued examination of strains during an epizootic will be very important. Although the antigenic differences within type A influenza virus are minor ones they, too, affect vaccine prophylaxis. The antigenic lability of the virus does not, however, seem to be as great as has been feared. As new variants of type A appear, the old ones seem to disappear, so that one antigenic variant may become dominant as a cause of human influenza over a period of years. It is suggested that investigation, over several years, of the problem of antigenic variation in swine influenza might provide valuable information.—A. M.-H.

PELLEGRINI, D. (1948.) **Primi casi di rabbia canina in Somalia. [First case of canine rabies in Somaliland.]—*Zooprofilassi.* **3.** No. 10. pp. 28-26. **904****

Italian Somaliland has been considered to be free from rabies and stringent quarantine regulations were enforced against imported dogs. A suspected case occurred at Mogadiscio early in 1946 but was not confirmed. A case which occurred in June 1946 was confirmed by the finding of Negri bodies in the brain and by the experimental infection of dogs, rabbits and g. pigs. Three other cases occurred in 1946 and 1947 and were confirmed on laboratory examination.—M. C.

ANON. (1949.) **La rage chez les animaux sauvages. [Rabies in wild animals.]—*Rev. Méd. vét., Lyon et Toulouse.* **100.** 307-309. **905****

The increased incidence of the disease following the war is noted. Indirect effects have even been seen among foxes in the U.S.A. In Yugoslavia rabid wolves from Roumania were responsible for increased outbreaks; whilst in Czechoslovakia and Austria, foxes from neighbouring countries have been responsible for epidemics. The possibility of spread into France is discussed. —G. V. LAUGIER.

JONNESCO, D. (1945-47.) **Rage chez l'homme par morsure de rat. Virus renforcé. [Human**

rabies transmitted by rat-bite.]—*Arch. roum. Path. exp. Microbiol.* **14. 186-188. **906****

A note on rabies in a man resulting 38 days after being bitten by a rat. The rat was presumably wild and was not caught after it had bitten the man. Rabies virus was isolated from the man's brain. In first passage the incubation periods were, in the rabbit three days, in the g. pig two days, and in the dog four days. The virus infected all of ten mice when given subcutaneously.

DALTON, P. J. (1949.) **Skin infection, presumably from a case of cow pox. [Correspondence.]—*Vet. Rec.* **61.** 591-592. **907****

D. describes two lesions on his thumb which he believes he contracted from a cow affected with cow pox. Attempts to infect a cow and a calf with material from these lesions were unsuccessful.

The lesions healed after 5-6 weeks, but the sites were still sensitive to touch and irritable to heat four months later. There is a photograph of the lesions. The interval which elapsed between handling the case of cow pox and the development of the lesions is not stated.—M. C.

VAN ROOYEN, C. E., & SCOTT, G. D. (1948.) **Smallpox diagnosis with special reference to electron microscopy.—*Canad. J. publ. Hlth.* **39.** 467-477. [Authors' summary copied *verbatim*.] **908****

Smallpox laboratory diagnostic methods have been reviewed, and the merits of each in relation to clinical stages of the illness are explained. Attention has been drawn to the claims of the electron microscope as a useful tool for the rapid and early diagnosis of smallpox.

BARDOULAT, Dr. (1949.) **Grippe des bovidés. [Bovine influenza.]—*Rec. Méd. vét.* **125.** 162-168. **909****

A brief account of the disease described by Moussu under the names of contagious bronchopneumonia, influenza and pasteurellosis. B. recognizes two forms: respiratory and alimentary. He was unable to demonstrate *Pasteurella* in any of his cases, and thinks the condition is a virus infection.—L. M. MARKSON.

LANNI, F., LANNI, Y. T., & BEARD, J. W. (1949.) **Inhibitory effect of cow's milk on influenza virus hemagglutination.—*Proc. Soc. exp. Biol., N.Y.* **72.** 227-232. [Authors' summary copied *verbatim*.] **910****

Milk is capable of inhibiting hemagglutination by influenza viruses, the inhibitory effect being greater against heated than against unheated viruses. The inhibitor, which is non-dialyzable and moderately heat stable, occurs in the whey and can be salted out by half-saturation with ammonium sulfate. Evidence is presented that

the inhibitor is a characteristic component of milk rather than a specific antibody.

HOTTLE, G. A., NEDZEL, G. A., WRIGHT, J. T., & BELL, J. F. (1949.) Allergic encephalitis following injection of dialysate of brain tissue.—*Proc. Soc. exp. Biol., N.Y.* 72. 289–291. Authors' summary copied *verbatim*.] 911

The dialysate of benzene-ether extracted brain tissue is capable of causing signs and lesions of allergic encephalitis in guinea pigs. The material recovered in the dialysate is free of protein and presumably contains only substances of low molecular weight.

ANON. (1949.) Italie. [Rinderpest in Rome.]—*Bull. Off. internat. Epiz.* 32. 288. 912

This is a brief note to the effect that on the 8th July [1949] a note had appeared in the daily press announcing an outbreak of infectious disease in the Zoological Gardens at Rome [see *V.B.* 20. 81]. On seeing this the Office International des Epizooties had requested further information from the authorities in Rome. The ministry of health confirmed the existence of a disease, investigation of its exact nature was being made and in the meantime rigorous measures were being taken to prevent spread of infection. On the 30th July the ministry of health informed the Office International that the disease had been diagnosed as rinderpest and that all ruminants in the Zoo at Rome had been slaughtered. No cases had occurred outside the Zoo and the outbreak could be considered as eradicated.—M. C.

MOHAN, R. N. (1948.) Cutaneous eruptions in rinderpest.—*Indian J. vet. Sci.* 18. 27–32. 913

The appearance of cutaneous eruptions was observed in cattle during the course of several rinderpest outbreaks in Bengal (though such an infection had seldom been reported from other parts of India). The lesions were in the form of small, discrete, reddish spots like "mosquito bites" appearing simultaneously with conjunctivitis, mouth lesions, diarrhoea, etc. Later the eruptions developed into pustules with seropurulent discharge. The most common sites of such eruptions were the region of the shoulder, chest, thighs, neck and dewlap.

The eruptions were much more commonly seen in isolated and mild outbreaks and towards the end of bigger epizootics than in the midst of severe and widespread outbreaks.—G. A. S.

GILLAIN, J. (1947.) Essai de sensibilisation du virus pestique bovine adapté sur chèvre à l'aide du sérum antipestique. [Sensitization of rinderpest goat adapted virus by means of antiserum.]—*Bull. agric. Congo belge.* 38. 59–62. 914

A number of experiments were made on 36

calves inoculated with goat-adapted virus mixed with small quantities of anti-rinderpest serum, the mixtures being held in a refrigerator for periods varying from 15–22 hours before inoculation. The results are tabulated. In some of the groups of calves the reaction was mild as judged by length of the incubation period, and the degree and duration of the rise of temperature. This could not be attributed to any passive immunity conferred by the very small quantity of antiserum contained in the inoculum and G. is of opinion that it indicates a modification of the virus.—M. C.

THOMAS, A. D., & NEITZ, W. O. (1947.) Further observations on the pathology of bluetongue in sheep.—*Onderstepoort J. vet. Sci.* 22. 27–40. 915

From a study of materials obtained in the course of extensive work on experimental immunization of sheep, the authors obtained some new information on the pathology of the disease. The macroscopic and microscopic appearances of lesions in the skeletal muscles receive particular attention. Lesions in the hooves, lungs and spleen are also described. The pathogenesis of the muscular lesions is discussed and it is stated that the appearances in the muscles in heartwater are not unlike those described by other workers in vitamin E deficient rats and dogs. The muscle and hoof lesions are illustrated.—M. C.

HARRISS, S. T. (1948.) Proliferative dermatitis of the legs ("strawberry foot rot") in sheep.—*J. comp. Path.* 58. 314–328. 916

Strawberry foot rot (S.F.R.) is a disease which is clinically similar to contagious pustular dermatitis (C.P.D.), but which confers no immunity to the latter or even against itself. Also, C.P.D. is mainly a disease of lambs, while S.F.R. attacks sheep of all ages.

In natural cases, the first lesion is a heaped up scab at any point between the coronet and knee or hock, but usually in front of the coronet. No papular stage has been observed. The whole limb may become involved, but resolution generally occurs when lesions have become 2–4 cm. in diameter. Woolled areas are rarely affected and natural infection of the face has not been observed (cf. C.P.D.). Experimentally, the lip may be infected, but the lesion is regressive and does not suppurate. Most lesions heal in 5–6 weeks; frost seems to prevent appearance of the disease and terminates chronic infection. The incubation period appears to be about ten days to four weeks. Experimental transmission by rubbing infective material into the scarified skin of sheep was successful, but rats, mice, g. pigs and rabbits failed to develop lesions. Man is susceptible. Natural transmission is probably by dried crusts

which fall on to the pasture; at 0°–4°C., the infective agent remains viable in these crusts for more than a year.—G. B. S. HEATH.

HORGAN, E. S., & HASEEB, M. A. (1948.) The immunological relationship between a new virus, proliferative dermatitis of the legs ("strawberry foot rot") of sheep, and the viruses of vaccinia and contagious pustular dermatitis.—*J. comp. Path.* 58. 329–332. 917

In laboratory tests, exposure of sheep to the virus of strawberry foot rot induced immunity to further infection [cf. field evidence described in following abst.]. Immunologically, the virus differs from those of vaccinia and contagious pustular dermatitis.—G. B. S. HEATH.

ABDUSSALAM, M., & BLAKEMORE, F. (1948.) Some observations on proliferative dermatitis of the legs "strawberry foot rot" of sheep.—*J. comp. Path.* 58. 333–337. 918

Histologically, the lesion of strawberry foot rot (S.F.R.) is very different from that of contagious pustular dermatitis (C.P.D.); the infective agent is inhibited by ether, and it cannot be seen in electron micrographs. Thus, it is improbable that it is C.P.D. virus or a virus of the pox group. However, sheep which have recently recovered from C.P.D. are resistant to S.F.R., and the authors suggest the possible existence of an antigenic relationship between S.F.R. virus and C.P.D. virus, or the secondary invaders of the C.P.D. lesion.—G. B. S. HEATH.

ZOFIJEVSKÝ, V. (1948.) O vzájemném vztahu mezi pestis suum a influenza suum. [The relation between swine fever and swine influenza.].—*Čas. československ. Vet.* 3. 342–352. 919

MACÉK's paper [see *V. B.* 19. 387], stating that Teschen disease, swine fever and swine influenza are variations of the same virus infection, is criticized. Z. does not regard as convincing Macék's claim to have produced symptoms of Teschen disease in rabbits by injecting them subdurally with a brain suspension from pigs that had died of swine fever. The presence of *Toxoplasma* or ascarids may cause a similar spasmodic paralysis. *Erysipelothrix rhusiopathiae* infection is often accompanied by severe nervous disorders. Therefore nervous symptoms alone cannot be regarded as indicative of Teschen disease. He states that Macék has so far been the only one to succeed in infecting rabbits experimentally with the virus of swine fever, although several prominent scientists have failed in the attempt [but see KOPROWSKI, H., *et al.*, and BAKER, J. A., *V. B.* 19. 210].

Histological comparison of changes in the brain tissue of pigs infected with swine fever,

swine influenza and Teschen disease has no significance as none of these diseases causes specific changes in the brain tissue.—E. G.

GALLIA, F. (1949.) Negativní výsledky pokusů o adaptaci viru těšinské choroby na kuřecí embrya respektive na kuřata. [Attempts to cultivate Teschen disease virus in the chick embryo.].—*Čas. československ. Vet.* 4. 403–406. [English and Russian summaries. English summary slightly modified.] 920

In order to ascertain the possibility that the inoculation of embryonated eggs with strains of Teschen disease virus will cause paralysis in the hatched chickens as reported by Harnach at the Congress of Czechoslovak microbiologists in Karlovy Vary, May 1949, series of such tests have been carried out with two strains of Teschen disease virus. The results may be summed up as follows: (1) Of 60 ten-day-old embryonated eggs inoculated with two 1st pig-passage strains into the allantoic cavity 41 (68.4%) hatched, and of 30 uninoculated eggs 24 (75%) hatched. Two of the inoculated and two of the control chicks died during the observation period of one month, no paralysis of legs or wings having been observed. (2) Ten of the "infected" and ten normal chicks were inoculated intracerebrally once daily with one of the strains during the first four days of life. With the exception of one of the "infected" chicks which died on the second day without signs of paralysis, all remained healthy. A chick-passage made with the brain of the dead chick also gave negative results. (3) 35 four-day-old embryos were inoculated with one or the other strain on four consecutive days. Only 12 (34.5%) of these eggs hatched, about the same number as of eggs inoculated similarly with saline. One of the "infected" and one of the normal chicks died without any signs of paralysis. (4) Of 15 ten-day-old embryos inoculated intracerebrally with one of the strains seven hatched and all remained healthy during the one month period of observation.

An account is given of other poliomyelitis viruses, all of rodent origin, which have been successfully cultivated in eggs. G.'s negative results concern only two strains of Teschen disease virus, and the study of other strains may reveal different results. The possibility is stressed that the growth of poliomyelitis viruses in embryonated eggs might serve for the grouping of these viruses according to other than immunological view-points.

MANNINGER, R. (1948.) Gastro-entérite infectieuse du porc. [Infectious gastro-enteritis of pigs.].—*Bull. Off. internat. Epiz.* 29. 238–241. 921

The symptoms and pathological changes of infectious gastro-enteritis in pigs are described. The changes in the alimentary tract are those of an acute enteritis with diphtheresis. Degeneration of the heart muscle and sometimes of the skeletal muscle has also been described. The condition is considered contagious although no specific organism has so far been incriminated.

Difficulties are encountered in trying to reproduce the disease using material from a pig which has died from it. Virus has, however, been demonstrated in the blood taken during the early temperature reaction. This blood either given *per os* or inoculated subcutaneously causes a rise of temperature in 2-3 days followed by gastro-enteritis in some of the inoculated pigs. Serial transmission has been carried out. It is suggested that infectious gastro-enteritis may be a predisposing factor in swine erysipelas outbreaks in Hungary.

An analogous condition has been described in America, in Italy and in Germany. On account of the frequent sudden deaths Köbe in Germany has proposed the name cardiac apoplexy for the similar condition described by him.—D. LUKE.

KRESS, F. (1949.) Zur Frage der Schutzimpfung mit Organvakzine gegen einzelne Virusinfektionskrankheiten, insbesondere gegen die Hundestaupe. [Prophylactic vaccination with tissue vaccine against virus diseases, particularly canine distemper.]—*Wien. tierärztl. Mschr.* 36. 189-198. 922

Encouraged by good results obtained by using formalized tissue vaccines against virus abortion in mares, virus pneumonia of calves and porcine encephalomyelitis, K. prepared a vaccine using infected tissues from dogs that had had distemper pneumonia, with the addition of formaldehyde. The results were inconsistent, severe local reactions occurred in some cases at the site of injection.—R. ROSS-RAHTE.

GORET, P. (1949.) Le virus de Carré et l'immunisation contre la "Maladie des chiens". [Immunization in distemper.]—*Canad. J. comp. Med.* 13. 237-246. [In French.] 923

Distemper virus is capable of natural and artificial adaptation to species other than the dog and such modifications change the clinical aspects. All such viruses examined since 1936 were identical in immune reactions and the plurality of the virus is not accepted. The small percentage of cases in which distemper virus could be recovered from dogs with "distemper" (32.3%) raises the question of whether in fact the virus is always the cause of "distemper". Bacterial and neurotropic virus infections, hard pad disease and others may simulate dog distemper and

differential diagnosis is very difficult. A good vaccine should protect 95% of the subjects. Failures may be explained by qualitative modification of the pathogenicity of the virus in some cases and the existence, possibly in France, and certainly in other countries, of distemper different to the disease of Carré.—R. GWATKIN.

LEHNERT, E. (1948.) Der Wert der Komplementbindungsmethode bei der *Hepatitis contagiosa canis*. [The value of the complement fixation test in hepatitis contagiosa canis.]—*Skand. Vet.Tidskr.* 38. 94-107. [In German, English summary.] 924

The test is a haemolytic complement-fixation test, using g. pig complement, goat erythrocytes and goat haemolysin. 14% of the examined dog sera were anticomplementary. Apart from this, the test as described was found to be specific. Complement binding substances do not appear in the serum before the seventh day after infection, but they may be detected for months thereafter. Of 229 dogs tested, 45% gave positive reactions, 11% were doubtful and 44% were negative.

L. demonstrated complement binding substances in the blood of foxes infected with the virus of hepatitis contagiosa canis. Another antigen of similar type was found in a sick cat, the liver of which had lesions resembling those of contagious hepatitis in the dog.

—L. M. MARKSON.

ANON. (1948.) La peste aviaire espagnole. [Fowl plague in Spain.]—*Bull. Off. internat. Epiz.* 29. 107-110. 925

This is an account of outbreaks of fowl plague in Spain which started in the summer of 1947 and caused very heavy mortality. The disease is said to have had features which differ from both classical fowl plague and Newcastle disease. Only fowls, pheasants and quails were affected; no cases were seen in turkeys, ducks or geese.

Pigeons were not affected naturally, but could, with some difficulty, be infected experimentally. In the early outbreaks respiratory symptoms were not observed and death often occurred within 24 hours of the onset of symptoms. The prominent symptoms were prostration and dilatation of the crop. The lesions consisted of haemorrhages in the larynx, trachea and proventriculus. [There is no mention of any attempt to isolate and identify the virus.]—M. C.

BAKOS, K., & NORDBERG, B. K. (1949.) Comparative investigations with the virus of the "Fowl Pest" (Newcastle disease) in Sweden. —*Nord. Vet.-med.* 1. 739-749. [In English. Abst. from authors' summary.] 926

In an outbreak of a disease resembling fowl pest in Sweden in 1947 the authors isolated a

virus which was proved to be identical with English, German and Hungarian strains of Newcastle disease virus, using the following tests; haemagglutination, haemagglutination-inhibition, neutralization and cross immunization experiments.

JANSEN, J., KUNST, H., VAN DORSSEN, C. A., & V. D. BERG, H. A. (1949.) *Pseudovogelpest bij fazanten uit Calcutta. [Newcastle disease in pheasants from Calcutta.]—Tijdschr. Diergeneesk. 74. 933-936. [Abst. from English summary.]* 927

Newcastle disease was found in Holland for the first time in 50 pheasants sent from Calcutta by airplane, 26 of which arrived dead and the others died shortly afterwards. "Stamping out" measures (burning of carcasses and disinfection) were immediately taken. Newcastle disease virus was isolated (egg cultivation) and accurately identified (Hirst test and inhibition test). No spread of the infection was observed.

LIEBENGOD, D. M. (1949.) *Avian pneumoencephalitis in pheasants. [Correspondence.]—Vet. Med. 44. 443.* 928

Each night for three nights 100 six-day-old pheasant chicks died with respiratory symptoms and nervous incoordination. The remaining 300 were vaccinated with avian pneumoencephalitis (Newcastle disease) vaccine. The following day 30 died, and then the losses abruptly stopped, but it is not known whether the disease had run its course or whether the vaccine was entirely responsible.—J. O. L. KING.

HOFSTAD, M. S. (1949.) *Recovery of Newcastle disease (pneumoencephalitis) virus from mites, Liponyssus sylviarum, after feeding upon Newcastle-infected chickens.—Amer. J. vet. Res. 10. 370-371. [Author's summary copied verbatim.]* 929

Newcastle disease virus was isolated from washed mites, *Liponyssus sylviarum*, from chickens killed on the fourth day after inoculation in two trials, and on the sixth day in one instance. Virus was not isolated from mites collected from birds killed on the sixth day after inoculation in one trial and on the seventh day in another trial. Under conditions of the experiment, Newcastle disease-infected mites were unable to induce infection in adult roosters.

SPALATIN, J. (1948.) *Hiperimuni serum kuge peradi. [Hyperimmune serum against Newcastle disease. Use of antisera.]—Vet. Archiv. 18. 187-192. [English & German summaries, abst. from English summary.]* 930

A preliminary report on the production of Newcastle disease hyperimmune serum obtained from turkeys, pigs and horses.

Comparative titrations of the sera were made first on chickens and later on chick embryos. The sera obtained from pigs and horses were found to be of equal potency with the serum obtained from turkeys, 1 ml. being sufficient to neutralize 10,000,000 m. l. d. of atypical fowl pest virus.

Use of the serum is indicated on farms at the beginning of an outbreak for control and treatment. As a result of about 100 trials on over 2,000 diseased and exposed fowls, it was observed that the serum is able, especially at the beginning of an outbreak, to check further infection and to have a therapeutic effect on a certain percentage of diseased fowls. In order to transform passive immunity into an active one, it is recommended that the remaining poultry be vaccinated within 4-8 days after the application of serum.

[Other workers have failed to produce potent immune serum from mammals.]

HITCHNER, S. B., & JOHNSON, E. P. (1948.) *A virus of low virulence for immunizing fowls against Newcastle disease. (Avian pneumoencephalitis.)—Vet. Med. 43. 525-530.* 931

The B1 strain of virus was inoculated intranasally into a group of baby chicks. They showed little reaction, but 19 days later were immune to a known virulent strain of virus. A vaccine was made of 20% broth suspension of entire embryos previously inoculated with the B1 virus. Vaccination was performed by intranasal instillation of the vaccine into one nostril by means of a syringe with a blunt 21-gauge needle, using approximately 0.05 ml. for birds of all ages. Under controlled segregation no evidence of infection was observed in the older birds as a result of vaccination, and only in occasional chicks were any respiratory symptoms noted. When tested with a virulent strain, N2, only one bird out of a total of 50 of varying ages vaccinated developed paralysis, but 40 out of 46 controls were affected. The longest period over which the immunity was tested was 115 days. All vaccinated birds 99 days old tested with the virus N2 three days after inoculation or later were immune, but the protection was delayed with decreasing age and day-old chicks were not completely immune till the sixth day.

Vaccination of laying birds did not produce a drop in egg production. Limited tests on chicks from B1 vaccinated hens indicate that very little passive immunity is transferred through the egg.

In a field test on a laying flock of 1,500 White Leghorns it was found that Newcastle disease spreading rapidly through the non-vaccinated pen reduced egg production to zero, but, although there was a decrease in production in the 750 vaccinated birds a comparatively high level of production was maintained. A limited number

of field trials have been conducted on chickens of various ages, including some day-old chicks, without unfavourable reports, except in one case in which it is thought that the chicks might have been exposed to a more virulent strain prior to vaccination.—J. O. L. KING.

LUCAM, F. (1949.) Vaccination contre la peste aviaire à partir du virus de culture. [A vaccine for Newcastle disease prepared by passage in the chick embryo in France.]—*Bull. Acad. vét. Fr.* 22. 163–166. 932

A vaccine was prepared from egg propagated virus adsorbed on aluminium hydroxide and formolized. A satisfactory immunity was established to both experimental and natural infection. —D. LUKE.

SCHOENING, H. W., OSTEEN, O. L., LEGENHAUSEN, D. H., ANDERSON, W. A., & HALL, W. J. (1949.) Vaccination against Newcastle disease with formalin-inactivated commercially produced vaccines.—*Amer. J. vet. Res.* 10. 176–182. 933

This study to determine whether chickens vaccinated at the age of three or four weeks would be protected against Newcastle disease by formalin-inactivated commercially prepared vaccines was carried out in a large broiler plant where the disease was known to exist. One house held 17,000 chicks at a day old and had a mortality of 346 (2.03%) and a second had 20,000 with a mortality of 1,200 (5.1%) up to the date of vaccination. The third house was the control with 20,000 chicks and a total mortality of 1,228 (6.14%) up to the same age. Two vaccines were used, one being a 25% saline suspension of chick embryo-propagated virus and the other a 50% suspension. There was no difference in protective quality. The total cost of the vaccine and its administration was 1.73 cents per bird. In the first (vaccinated) house manifestations of the nervous form of Newcastle disease were noticed at eight weeks of age, and the losses from the disease were 0.5% and the total losses 10.5%. There was an outbreak of Newcastle disease among birds in the second house at the time of vaccination, and the losses from this cause were 2.1% and the over-all losses 12.1%. The losses in the unvaccinated birds were 26% from Newcastle disease, and 36% total. A financial profit was made on birds which were vaccinated, whereas the birds in the unvaccinated group represented a loss.—J. O. L. KING.

KOMAROV, A., GOLDSMITH, L., & KAHANE, Y. (1948.) [Duration of immunity following vaccination with Haifa strain Newcastle vaccine.]—*Refuah vet. Palestine.* 5. 50. English summary p. 75. [Abst. from English summary.] 934

The immunity of birds vaccinated in the field was tested six and nine months later. The vaccinated birds resisted inoculation with a virulent virus which killed controls within ten days.—M. C.

REAGAN, R. L., WERNER, H. O., HARTLEY, J. W., SCHENK, D. M., & BRUECKNER, A. L. (1949.) Response of the Syrian hamster to intradermal injection of modified Newcastle disease virus.—*Proc. Soc. exp. Biol., N.Y.* 72. 163–165. [Authors' summary copied *verbatim*.] 935

After the 300th intracerebral and the 14th intranasal hamster passage, Newcastle disease virus, California strain No. 11,914 can successfully infect hamsters by intradermal injection. The virus in the brain material from each series was passed intradermally in hamsters. Virus was isolated from the brain and cord of hamsters of both series upon inoculation of embryonated chicken eggs. The results of the neutralization tests confirm the virus to be that of Newcastle disease. Hamsters infected intracerebrally, intranasally, and intradermally show similar symptoms, such as involuntary motor reactions, excessive salivation from pharyngeal paralysis, general paralysis, prostration, and death.

WENNER, H. A., & LASH, B. (1949.) Chorio-meningo-encephalitis following inoculation of Newcastle disease virus in rhesus monkeys.—*Proc. Soc. exp. Biol., N.Y.* 70. 263–265. 936

The Manhattan strain of Newcastle disease virus was grown in 10-day-old embryonated eggs, and five rhesus monkeys received 0.8 ml. of undiluted allantoic fluid in the brain. All became sick, one died on the sixth day, one was killed on the seventh day, and the other three recovered. The central nervous system of the monkey which was killed was inoculated intracerebrally into two rhesus monkeys, Swiss mice, hamsters, g. pigs, cotton rats, and embryonated eggs. The chick embryos died, and Newcastle disease virus was recovered from them, and one monkey sickened, but the other animals remained well. The central nervous system histology in the monkeys was characterized by encephalitis, focal meningitis, and inconstant and intense inflammation of the choroid plexus.—J. O. L. KING.

GROUPÉ, V. (1949.) Demonstration of an interference phenomenon associated with infectious bronchitis virus (IBV) of chickens.—*J. Bact.* 58. 23–32. [Author's summary copied *verbatim*.] 937

The rate of death of chicken embryos inoculated with undiluted allantoic fluid from infected eggs stored for 24 hours at 36°C. after death of the embryo was found to be markedly lower than the rate of death of embryos inoculated

with the same fluid diluted 1:10 or more. This phenomenon was not observed in titrations of infected allantoic fluid from living embryos or from embryos dead less than 2 hours and stored for 24 hours at 4°C. Attempts to produce such interference by similar treatment of normal embryos or by similar incubation of infected allantoic fluid *in vitro* alone or in the presence of normal chorioallantoic membranes were unsuccessful. Undiluted allantoic fluid containing interfering material and rendered non-infective for embryos by heat (56°C. for 10 minutes) strikingly delayed the rate of embryo deaths when inoculated into the allantoic sac 30 minutes before active IBV.

WELLS, E. B., & FINLAND, M. (1949.) **Comparative effect of aureomycin and chloromycetin on psittacosis infection in chick embryos.**—*Proc. Soc. exp. Biol., N.Y.* **72**, 365-368. [Authors' conclusions copied *verbatim*.] **938**

Both aureomycin and chloromycetin prolong the life of chick embryos infected with 6 B C strain of psittacosis virus. There is a direct relation between the dose of antibiotic and the prolongation of life of the embryos, the infecting dose being kept constant. With equal doses of the antibiotics, aureomycin prolonged the life of the embryos for an average of from 2 to more than 3 days longer than chloromycetin, depending on the dose used.

On a weight basis, aureomycin was more than 3 times as effective in protecting chick embryos against the dose of virus that was used in this study. On a molecular basis the aureomycin was more than 5 times as effective as chloromycetin in this infection.

WAHL, R., & BLUM-EMERIQUE, L. (1949.) Calcium et phosphates dans la multiplication de bactériophages. [Calcium and phosphorus in the multiplication of bacteriophages.]—*Ann. Inst. Pasteur.* **77**, 137-142. **939**

For multiplication of bacteriophages the calcium and phosphates of the medium are of the utmost importance. The optimal calcium content is 80-100 mg. per l. Whereas some bacteriophages are not sensitive to an excess of phosphates, others, although requiring a minimum of about 50 mg. per l., are inhibited by a concentration of 500 mg. per l. A mutant phage strain was observed to be phosphate sensitive when propagated with a mutant of the bacterial strain, and phosphate resistant when propagated with the original strain.—A. MAYR-HARTING.

LABAW, L. W., MOSLEY, V. M., & WYCKOFF, R. W. G. (1949.) **Lysis of formalinized bacteria by bacteriophage.**—*Science*, **110**, 275-276. **940**

Bacteriophage added to formalin-killed and washed bacteria produced a similar picture in the electron microscope as that observed with living bacteria, namely ruptured bacterial cells containing bacteriophage particles. The number of particles seen depends on the formalin concentration used to kill the bacteria. The multiplication of phage could be confirmed by plaque counts if the cells had been killed by exposure to 0.04% formaldehyde, but the plaque count was much reduced if the cells had been killed with 0.2% formaldehyde. Some explanations are suggested for the discrepancy between plaque count and the particles seen in the electron microscope.—A. M.-H.

LACKMAN, D. B., PARKER, R. R., & GERLOFF, R. K. (1949.) **Serological characteristics of a pathogenic rickettsia occurring in *Amblyomma maculatum*.**—*Publ. Hlth Rep., Wash.* **64**, 1842-1849. [Authors' summary and conclusions copied *verbatim*.] **941**

A serological study has been made of a rickettsia recovered from ticks (*Amblyomma maculatum*) collected in Texas, Georgia, and Mississippi. The reactions obtained place it in the Rocky Mountain spotted fever group of rickettsiae. This agrees with previous findings. Results obtained in rabbits and guinea pigs indicate that it is less virulent for these animals than are most *Dermacentor andersoni* or *D. variabilis* strains of spotted fever. Analysis of sera for complement-fixing antibodies demonstrates that this rickettsia is related in antigenic structure to Rocky Mountain spotted fever but is not identical with it or any other known member of the spotted fever group.

MCCALLUM, F. O., MARMION, B. P., & STOKER, M. G. P. (1949.) **Q fever in Great Britain. Isolation of *Rickettsia burneti* from an indigenous case.**—*Lancet*, **257**, 1026-1027. [Authors' summary copied *verbatim*.] **942**

A strain of *Rickettsia burneti*, the causative agent of Q fever, has been isolated from 1 of a group of 7 serologically proven cases Q fever associated with an outbreak at the Royal Cancer Hospital. Epidemiological investigations have established the existence of an endemic focus of the disease in south-east England, and further investigations are being carried out to estimate the prevalence of the disease in man and animals in other parts of the country.

Attention is drawn to the need for care in removing serum from the blood-clot in cases of atypical pneumonia and in handling the organs of fatal cases of pneumonia.

HARMAN, J. B. (1949.) **Q fever in Great Britain. Clinical account of eight cases.**—*Lancet*, **257**, 1028-1030. [Author's summary copied *verbatim*.] **943**

The clinical features of Q fever are described. Eight cases arising in England are reported.

PARKER, R. R., DE PRADA, J., BELL, E. J., & LACKMAN, D. B. (1949.) **Recovery of *C. burnetii* from *H. savignyi* collected in Spain.**—*Publ. Hlth Rep., Wash.* **64.** 1616-1618. [Authors' discussion slightly amended.] **944**

The identification of the infectious agent isolated from the two groups of *Hyalomma savignyi* as *Rickettsia burneti* is clearly justified by the positive complement fixation and immunity tests for Q fever.

Blanc et al. in 1946 reported the recovery of *R. burneti* from ticks of this same species collected from the ground near the burrows of gerbils (*Meriones shawi*) in Southern Morocco. This strain was forwarded to the Rocky Mountain Laboratory in specimens of *Rhipicephalus sanguineus*. Although these ticks were dead and quite dry upon receipt in October 1946, the infectious agent was readily recovered from them, and complete cross-immunity was demonstrated between this Moroccan strain and American, Australian,

See also *absts.* **1030** (dermatitis in pigs); **1166** (N. Rhodesia, report); **168** (Brit. W. Indies, report); **1173** (book, rabies).

Italian, and Panamanian strains of Q fever.

BELLER, K., & BAUER, K. (1949.) **Vorkommen und Bedeutung von Rickettsien auf den Lidbindehäuten von Tieren. [Rickettsial conjunctivitis in animals.]**—*Zbl. Bakt. (I. Orig.)* **153.** 174-177. [English, French & Russian summaries. English summary slightly amended.] **945**

On the strength of the demonstration of rickettsiae in the palpebral conjunctivae of horses and their propagation in connection with artificial or natural conjunctivitis of unknown origin a differentiation is made between primary and secondary rickettsioses. It is only with reference to the former that the new species of rickettsiae which have been found can be given names and that one can speak of genuine rickettsioses. The statements made on latent rickettsioses and the discovery of alleged multiple infections in genuine rickettsioses therefore require a correction to the effect that in such cases the incidental occurrence of non-pathogenic rickettsiae of another origin must be excluded.

IMMUNITY

MILLBERGER, H. (1949.) **Das Infektionsgeschehen ein chemisches Problem? [The infectious process as a chemical problem.]**—*Zbl. Bakt. (I. Orig.)* **153.** 134-145. [English, French & Russian summaries. English summary copied *verbatim*.] **946**

The "defence" theory according to which the infectious process is a struggle between the macro- and micro-organism is contrasted with a new view called "affinity" theory finding the cause for the origin of an infectious disease in the chemical affinity between the macro- and the micro-organism on the strength of determinant groups and explaining the resultant immunity through a binding process between the two partners.

SMITH, R. O., & WOOD, W. B., Jr. (1949.) **Cellular mechanisms of antibacterial defense in lymph nodes. I. Pathogenesis of acute bacterial lymphadenitis. II. The origin and filtration effect of granulocytes in the nodal sinuses during acute bacterial lymphadenitis.**—*J. exp. Med.* **90.** 555-566; & 567-576. [Authors' summaries copied *verbatim*.] **947**

I. Acute pneumococcal lymphadenitis produced in rats by intradermal inoculation of the foot-pad is characterized by rapid infiltration of polymorphonuclear leucocytes into the intermediary sinuses of the node, and prompt phagocytosis of pneumococci by both the macrophages of the sinuses and the recently arrived

leucocytes. After 5 to 7 hours the polymorphonuclear leucocytes are found densely congregated about the hilar region, and 9 hours after inoculation most of the phagocytosed organisms have been digested. At the end of the 24 hour period the popliteal node presents the picture of a subsiding inflammation with a marked macrophage reaction and regenerating lymph follicles.

Phagocytosis of encapsulated pneumococci in the foot-pad and popliteal node occurs in less than 30 minutes after inoculation. It is assumed that this prompt phagocytosis is effected by the non-antibody mechanism of "surface phagocytosis".

The majority of polymorphonuclear leucocytes that enter the sinuses of the inflamed node appear to come from capillaries within the node itself rather than from the primary site of inflammation in the foot-pad. The prompt inflammatory response of the nodal tissues serves as an active defense against lymph-borne infection.

Macrophages invade nodal sinuses only after most of the pneumococci have been destroyed by polymorphonuclear leucocytes. It is suggested that the macrophage reaction follows removal of the primary inflammatory stimulus by the granulocytes, and thus constitutes only a late phase of recovery.

Fibrin formation in the sinuses of the lymph node is rare during acute lymphadenitis. This finding may be related to the observation that

within 5 minutes after entrance of bacteria into the node, heparin-containing granules from mast cells are strewn throughout the sinuses.

II. The origin of the polymorphonuclear leucocytes found in the intermediary and subcapsular sinuses of the popliteal lymph node during acute bacterial lymphadenitis, and the effect of this leucocyte infiltration on the passage of bacteria through the lymph node have been investigated. It has been demonstrated that: (1) The polymorphonuclear leucocytes in the nodal sinuses originate both from blood vessels of the lymph node and from the primary inflammatory focus in the tissues. (2) Granulocytes invading the intermediary sinuses of the infected lymph node arise primarily from capillaries lining these sinuses. (3) Most of the polymorphonuclear leucocytes in the subcapsular sinus, on the other hand, originate from the inflammatory focus in the tissues and appear to traverse the node by way of this peripheral sinus. (4) The bacteremia following direct intralymphatic injection of pneumococci is suppressed by the presence of preformed inflammatory exudate in the nodal sinuses indicating that the filtering capacity of the node is thereby greatly increased.

JAMES, E. P. V., & SAMSELL, E. (1949.) Failure of adrenocortical extract to modify the immunity acquired by intact mice through the use of pneumococcal vaccine.—*Endocrinology*. 45. 204-207. [Authors' summary slightly modified.] 948

White Swiss mice were immunized with Type I pneumococcal vaccine and simultaneously treated with adrenocortical extract; later they were challenged with living pneumococci of the same strain. In all instances the results were negative, indicating that administration of the extract early in the immunization period did not modify the resistance of the animals to active homologous infection.

ROBERTS, S., ADAMS, E., & WHITE, A. (1949.) Influence of mode of immunization on the relationship between the development of tissue titers and the release of hemolysins *in vitro*.—*J. Immunol.* 62. 155-170. 949

Rats were immunized in two groups [numbers not stated]; one group received a single intravenous injection of 0.5 ml. of 2% washed sheep's erythrocytes and the other group received 4 to 11 successive intraperitoneal injections of 1 ml. of 10% sheep's cells. The animals were killed at varying times thereafter by exsanguination under anaesthesia, and selected tissues were extracted by grinding in saline with sand and centrifuging; serum proved a poor extracting medium. A similar extraction was subsequently undertaken

after incubation of the tissue in serum (from non-immunized rats) for up to 12 hours at 38.5°C. with shaking and suitable aeration. By estimating the protein nitrogen and antibody titres in these extracts at the appropriate stages, it was possible to calculate the pre-incubation and post-incubation antibody extraction values (functions of the reciprocal of the titre and the protein nitrogen), the antibody release value and thus, the incubation increment. Several controlled experiments are presented to show that these values were relatively constant under the conditions of the experiment, that no infection had supervened, and that the pH remained constant.

Agglutination proved an unreliable method of estimating the antibody as non-specific agglutinins were found equally in control and immunized animals. Haemolysin titrations were satisfactory and conducted in the standard manner, complete haemolysis being taken for the end-point.

In the intravenous group, simple saline extraction yielded no antibody from perigonadal fat, brain, testis, muscle, lung or red cells. Antibody titres were highest in serum and splenic extract, reaching the maximum on the fifth day after immunization. Other lymphoid tissue extracts had high titres and other tissues had lower titres (although the duodenal extract was high).

Antibody release *in vitro* after incubation was demonstrated only in splenic extracts. This effect was diminished by substituting nitrogen for the usual oxygen-carbon dioxide aeration, suggesting that the *in vitro* manufacture and release of antibody was inhibited by anaerobic conditions. Antibody release continued throughout the 12-hour incubation period.

In the other group of animals which received repeated intraperitoneal injections, the results of simple extraction were similar to those in the former group except that the titres were generally lower. Thymic extracts, however, had much higher titres in this group. In the *in vitro* antibody release experiment in this group, the spleen did not release antibody, but lymphoid tissue did. It was also found that tissues from non-immunized animals would absorb antibody when incubated in immune serum.

The detailed results are given in table and graph form. The authors review some of the relevant literature and suggest that the role of the spleen vis-à-vis the lymphoid tissue in antibody production may depend on the route of administration of the antigen.—G. FULTON ROBERTS.

FABINYI, M., & SZEBEHELYI, J. (1949.) The mechanism of desensitization with histamine.—*Acta. allerg.* 2. 238-244. [In English, authors' summary copied *verbatim*.] 950

Desensitization with histamine specifically

reduces only histamine sensitivity in mice. The administration of Pyribenzamine does not prevent the establishment of histamine desensitization. The sensitivity to histamine of isolated intestines of desensitized mice is reduced. The serum of desensitized rats has no histaminolytic effect. The effect of histamine on the intercellular substance (collagen fibre) remains unchanged in desensitized animals. The hypertrophy of the adrenals plays no role in the establishment of histamine desensitization. Cholesterinaemia due to histamine does not influence desensitization.

ŽARNIĆ, I. (1948.) Metoda za masovna pretraživanja krvi vezanjem komplementa. [Complement fixation test for diagnosis of dourine and glanders.]—*Vet. Arhiv*. 18. 121-127. [French and Russian summaries. Abst. from French summary.] 951

Owing to a shortage of g. pigs, the author modified the classical haemolytic complement-fixation test by using only half the usual quantities of reagents. But the number of tests to be done was so great that further steps had to be taken. These consisted of testing two to five sera in one tube. If the tube was negative, its component sera were considered to be negative. If positive or doubtful, the component sera were tested again individually using the first modification.

—L. M. MARKSON.

PARRY, H. B., DAY, F. T., & CROWHURST, R. C. (1949.) Diseases of new-born foals. 1. Haemolytic disease due to iso-immunisation of pregnancy.—*Vet. Rec.* 61. 435-441. 952

A survey of haemolytic disease (icterus) of new-born foals resulting from pregnancy iso-immunization, based on six cases. The mares had all produced normal foals previously. The foals were all normal at birth and symptoms were evident between eight hours and five days after birth. In severe cases, haemoglobinuria was the first sign; later, lassitude, disinclination to suck, pallor and icterus may follow. Tachycardia and other cardiovascular symptoms of anaemia were seen. There was marked anaemia, but the white cells were normal.

Morbid anatomical changes were those of anaemia with jaundice; yellow staining of the brain substance was inconstant. There was no evidence of extramedullary erythropoiesis. Serologically it was shown that iso-antibodies active against the cells of the sires were present in the sera, milk and colostrum of the dams, in such a way as to suggest the operation of more than one antigen-antibody system. The foals' cells were positive to the direct sensitization reaction (using a rabbit anti-horse-globulin serum), but the test was negative in three cases of jaundice from other

causes. It was emphasized that the diagnosis can only be made unequivocally by serological methods.

Clinically the cases were divided into three groups; peracute, in which severe symptoms supervened 8-36 hours after birth (all three cases died); acute, in which less severe symptoms occurred 2-4 days after birth (the one case of this type died), and subacute, in which mild symptoms developed on the fourth or fifth day (the two cases recovering untreated).

In the absence of a foster-mother, the dams were permitted to continue suckling their foals, despite the risk of further transference of antibody. In two cases, one peracute and one acute, blood transfusions were undertaken with strikingly beneficial results in prolonging life, but death was not prevented. The blood was collected direct from the dam's jugular vein into glucose-citrate and stored at 4°C. Immediately before use the cells were washed several times in normal saline by centrifugation and the packed cells suspended by the addition of about half their volume of saline. By this means the raising of the haemoglobin level from 8 to 4.5 g. % could be accomplished with a smaller volume than the 750 ml. of whole blood which would have been required, and the danger of overloading the circulation thereby lessened. The transfusion apparatus was similar to that for use on human patients, and the rate was 120 drops per minute. P.M. examination of one animal which died after 12 days despite transfusion revealed evidence of renal damage.

The authors discuss the influence of suckling and transfusion on the condition, and consider the incidence and prevention of the disease.

[A comprehensive account of the clinical and therapeutic aspects of the disease; the serological details of these cases were reported by COOMBS *et al.* (see *V. B.* 19. 611).]—G. FULTON ROBERTS.

SAINT-MARTIN, A. (1949.) L'ictère hémolytique des muletons. [Haemolytic jaundice in mule foals.]—*Rev. Méd. vét., Lyon et Toulouse*. 100. 236-244. 953

The author, after reviewing the observations which led to the appreciation of iso-immunization as the cause of this disease, describes three grades of clinical severity based on 36 cases. In the mildest type (Forme fruste) the symptoms may pass unnoticed or at most consist of a temporary weakness and lack of interest in feeding. The diagnosis is confirmed by agglutination tests, and by increase in the erythrocyte sedimentation rate. In the intermediate syndrome, the animal appears ill, with pale and icteric mucous membranes; the heart beat is quickened and increased in force. The animal no longer feeds but remains lying on its side. There is marked anaemia but no haemo-

globinuria. In the most severe form the symptoms are marked, there is haemoglobinuria and partial suppression of urine; the animal dies within a few hours.

Treatment by exsanguination-transfusion is described. A plastic catheter is inserted into the vein and by means of a three-way tap, blood may be withdrawn from the animal, discarded, and replaced with a similar volume of fresh blood. 200 ml. volumes are exchanged at each step, the total varying from 1 to 6 l.; about 20 min. is required to replace one l. The amount transfused is generally greater than the amount withdrawn depending upon the degree of anaemia; amounts of more than one l. should be accompanied by 5 ml. of calcium gluconate to counteract the effects of excess of citrate. Sometimes cardio-vascular failure supervenes.—G. FULTON ROBERTS.

SAINT-MARTIN, A. (1949.) Sur l'ictère hémolytique des muletons. [**Haemolytic jaundice in mule foals.**]—*Rev. Méd. vét., Lyon et Toulouse*. 100. 299-301. 954

The author discusses the views of Spanish workers on this disease published by PUGET [see *V.B.* 19. 409] and deals with each in turn, principally by refutation.—G. FULTON ROBERTS.

I. BRION, A., & GORET, P. (1949.) Ictère hémolytique du muletton et du poulain. [**Haemolytic jaundice in young mules and foals.**]—*Rev. Méd. vét., Lyon et Toulouse*. 100. 387-349. 955

II. BERTHELON, M., & TOURNUT, J. (1949.) Sur l'étiologie de la maladie hémolytique du poulain nouveau-né. [**Aetiology of haemolytic disease in new-born foals.**]—*Ibid.* 344-349. 956

I. The authors discuss the relationship of placental permeability to antigens and antibodies. In some species (man and rodents) antibodies can pass freely across the placenta, but in others (*e.g.* the horse) the placenta acts as an impermeable barrier except occasionally in hyper-immunized animals when some antibody may pass. It is difficult to understand why the foetus causes immunization only in some cases [though a fuller knowledge of the blood groups of horses may explain this], why the first-born usually escapes the disease, and why the foetal cells are not haemolysed *in utero* [in man, it is possible that this may happen]. The authors in seeking to answer these questions suggest that a placental defect must occur in some cases which permits the foetal antigen to enter the maternal circulation, and may also allow the antibody to pass back to the foetus. In the majority of cases, however, the antibody is transferred *post partum*, via the colostrum and absorbed through the intestinal mucosa. It is pointed out that the mammary

signs in the mare and the weakly, stunted appearance of affected foals suggest that partial placental separation may have occurred and thus caused premature delivery. Two cases are described in support of these theories.

II. The authors describe a case clinically typical of icterus in the foal; no other cause for the foal's death could be shown. Serologically, however, no agglutinin was found in the mare's serum or colostrum, active against the foal's cells. [This procedure, however, does not rule out the possibility of iso-immunization since an incomplete form of agglutinin was not sought.] It was found, nevertheless, that the cells of the foal were susceptible to haemolysis in dilutions up to 1:32 of the mare's serum, and of a healthy mare's serum (sera were inactivated). Cells from a normal foal did not react in this way. No explanation of the phenomenon was found.

—G. FULTON ROBERTS.

BESSIS, M., & MILLOT, P. (1949.) A propos du rôle du lait et du colostrum dans la physiopathologie de l'ictère grave du muletton nouveau-né. [**The role of milk and of colostrum in the aetiology of jaundice in new-born mule foals.**]—*Bull. Acad. vét. Fr.* 22. 291-295. 957

In the course of the investigations of icterus in new-born mules caused by iso-immunization of pregnancy, the authors studied the antibody titre in the mare's colostrum. Although it varied from one case to another, it was always higher than that found in the blood or in the milk. The titre rapidly fell as colostrum was replaced by milk. The concentration of these harmful antibodies in the colostrum parallels the concentration of protective antibodies and other substances such as minerals and vitamins.

The mule foals are not affected clinically, nor are their cells sensitized as judged by the anti-globulin test, until suckling has begun. The disease does not develop if the foals are kept from their dams from birth until the antibody titre in the milk has fallen to a safe level, usually after about 48 hours. Such a prophylactic measure deprives the new-born of other constituents of the colostrum which may be valuable and so passive immunization against tetanus, and a purgative are recommended.

The authors note that the harmful effect of the mare's milk in this condition, and successful treatment by fostering the young with other mares, was reported as long ago as 1863.—G. F. ROBERTS.

POUSKA, F. (1949.) Fetální erythroblastosa. [**Foetal erythroblastosis.**]—*Čas. československ. Vét.* 4. 361-362. 958

A discussion containing no new information, reviewing contemporary literature on the Rh

factor in connexion with anaemia and icterus in new-born foals. P. states that during the 20 years of his practice he observed this condition on several occasions in foals which died immediately after birth or within seven days. He believes that it was caused by foetal erythroblastosis.—E. G.

SCHINDLER, R. (1949.) Ein Beitrag zur Frage der Bluttransfusion bei Pferden unter besonderer Berücksichtigung ihrer Wirkung auf das Blutbild des Empfängers und der antigenen Eigenschaften der Spendererythrozyten. [Blood transfusions in horses; the influence on the recipient's blood picture, and the antigenic qualities of the erythrocytes of the donor.]—*Mh. Vet.-med.* 4. 106-111. 959

After a résumé of previous work on blood transfusion in animals, S. reports some clinical and serological results of transfusion in horses.

Transfusion was undertaken on 11 horses, seven of which were ill [anaemia is implied] and four were apparently healthy. Some of the animals (including two of the healthy ones) were given between one and one and a half litres of whole blood by transfusion directly from the donor's jugular vein to that of the recipient. The others were given a similar volume of blood preserved with 30 ml. of sodium citrate, either immediately after withdrawal from the donor or after four hours' storage at 4°C. Direct compatibility tests were undertaken. The animals were thoroughly examined clinically and haematologically immediately before, and daily for 14 days after transfusion.

In three of the horses there were manifestations of shock after receiving citrated blood. S. believes that these were caused neither by blood group incompatibility (because no isoagglutinins were detectable at this time in the serum) nor by the presence of citrate (because it has been reported that citrate alone administered in similar concentrations and quantities was well tolerated by horses).

In the remaining horses there were no adverse symptoms and there was a rise in the numbers of red cells (of approximately 66,000 per c.mm.), the neutrophile leucocytes and platelets, but not of the lymphocytes. The rise was transient in the healthy animals, but persisted (except for the platelets) in those which were ill. No increase in immature forms of red cells was seen, but young forms of leucocytes were seen after transfusion. S. speculates to what extent these changes may result from the mere addition of blood and to what extent they may be related to a stimulus of the bone marrow by the transfusion.

To investigate the frequency of the formation of isohaemagglutinins, the serum of 12 horses was examined on the day that they were given 200 ml.

of citrated blood, and daily thereafter for 16 days. Four horses received blood from donor I (Group I in this series) and none of these developed isoagglutinins. Three horses received blood from donor II (Group II) and in all of these, isoagglutinins were demonstrated five days or more after transfusion. Two horses received blood from donor III (Group III) of which one developed isoagglutinins. Three further horses were transfused, two of which formed agglutinins against the donor's cells. Of 12 horses, therefore, six developed isoagglutinins after transfusion. In no case was agglutinin demonstrated before the fifth day after transfusion and, though the titres were not high (1:16 being the highest), they had not diminished by the 16th day. The antibodies were active not only against the donor's cells but also against a wide range of horse red cells; in some cases the undiluted sera haemolysed the test cells. A similar experiment was undertaken on one cow, and an agglutinin was demonstrated.

S. refers to the classification of horse blood groups of Schermer and Kämpfer and, in the absence of test sera and having regard to the incidence of the groups, postulates that his results would be compatible with a distribution of groups as follows (or similarly): Donor I, Recipients Group I, Group II and the immunized horse in Group III = AB₀; Donors II and III, Recipients Group II and the unreactive animal in Group III = ABC₀. He considers that additional blood group antigens in horses remain undetected.

[It has been shown that direct agglutination is less sensitive than the antiglobulin sensitization technique for detecting isohaemagglutinins in horses [see COOMBS *et al.*, *V.B.* 19. 611]. It is possible that some unreactive horses in this series may have formed antibodies of the "incomplete" type against the donor's cells, which would not have been detected by simple agglutination.]

—G. FULTON ROBERTS.

WISSLER, R. W., SMULL, K., & LESH, J. B. (1949.) The effects of various horse serum fractions in producing cardiovascular and renal lesions in rabbits.—*J. exp. Med.* 90. 577-594. [Authors' summary and conclusions copied *verbatim*.] 960

Five groups of 10 rabbits each were injected intravenously 2 times at 15 day intervals with either whole horse serum or one of its cold alcohol-precipitated fractions. Suitable serological and general observations were made at appropriate intervals before and after each injection. All animals were sacrificed on the 22nd day of the experiment. A study of the antemortem and pathological findings led to the following conclusions. (1) Allergic arteritis, valvulitis, and to a lesser degree, focal pericarditis, Aschoff-like nodules, and glomerulitis can be produced by

several of the cold alcohol-precipitated fractions of horse serum as well as by whole serum. (2) Most of the acute arteritis was seen in rabbits receiving fraction V (albumin). These rabbits showed the largest amounts of circulating antigen, low antibody titers, low tissue sensitivity, and slight elevation in sedimentation rate and temperature. (3) There was a high incidence of chronic arteritis in the rabbits receiving fraction III which is almost devoid of albumin, suggesting that the alpha and beta globulins in addition to albumin may produce arteritis. (4) A state most nearly resembling that of acute rheumatic fever was produced by either fractions III or IV-3,4 (alpha and beta globulins). Pancarditis (pericarditis, Aschoff-like lesions, and valvulitis) was found relatively frequently. Many of the rabbits developed a high sedimentation rate, elevated temperature, and high tissue sensitivity, but little acute arteritis was found in this group. (5) Gamma globulin (fraction II) produced little reaction either in the antemortem determinations or histopathologically. (6) Glomerulitis of an acute necrotizing type was seen in a few rabbits without particular correlation to the fraction injected. (7) The frequency of involvement of heart valves in rabbit serum disease follows a pattern very similar to that of rheumatic heart disease. (8) Attempts to correlate antemortem observations and pathological findings either on a group basis or for individual animals failed.

MCCARTY, M. (1949.) **The inhibition of streptococcal desoxyribonuclease by rabbit and human antisera.**—*J. exp. Med.* 90: 543-553. [Author's summary copied *verbatim*.] 961

Rabbit antisera against partially purified streptococcal desoxyribonuclease inhibit the action of the enzyme on its substrate. The activity of pancreatic desoxyribonuclease is not affected by these antisera. Similarly antibody against pancreatic nuclease does not inhibit the streptococcal enzyme.

Certain patients develop inhibitory antibody to streptococcal desoxyribonuclease following streptococcal infections, occasionally in very high titer, although the proportion of patients showing an antibody response appears to be lower than in the case of streptokinase and streptolysin O.

The pattern of antibody response to desoxyribonuclease has been compared to that of streptokinase and streptolysin O in a group of ninety patients from an epidemic of scarlet fever.

FELTON, L. D. (1949.) **The significance of antigen in animal tissues.**—*J. Immunol.* 61: 107-117. 962

The immunization of mice with the pneumococcal polysaccharide antigen decreases the animals' resistance to infection with *Pneumococcus*. Furthermore, after an injection of a large dose of the antigen, the antibody cannot be produced by a subsequent immunizing dose: a phenomenon termed immunological "paralysis."

Three groups of 200 mice were injected intraperitoneally with 0.5 mg. of pneumococcal polysaccharide of types I, II and III respectively ("paralysed groups"). At three monthly intervals 20 of each group and 20 normal mice were given an immunizing dose (0.0005 mg.) and tested for immunity seven days later. Most of the type I and II controls survived a million lethal doses of virulent pneumococci, but the "paralysed" mice succumbed to one lethal dose; these results were constant for 15 months for the type I group and for 18 months for the type II group. The "paralysed" type III group gave the same results, but the controls developed an irregular immunity which might be expected from the inconsistent antigen of this type. The immunological "paralysis", therefore, persists throughout the normal span of the animal's life.

When the tissues of "paralysed" mice were extracted so as to determine the quantity of antigen present, a small yield was found in liver, spleen, kidney, bone and muscle, heart, lung, intestine, blood and skin. The yields, expressed as a percentage of total antigen injected, were: type I, 1.0; type II, 13.7; type III, 16.4. The interval after the paralysing dose during which the antigen could be detected in the tissues appeared inconsistent but in some cases was as long as 52 weeks.

F. refers to a previous report in which the ability of 1,100 human beings to produce antibodies after immunization with type I and type II pneumococcal polysaccharide antigens was described. A small number of individuals (60 in type I and 12 in type II) failed to produce antibody and were termed negative reactors. The incidence of the disease is less than the incidence of negative reactors (type I, incidence of disease 1.3 per thousand, of negative reactors 55 per thousand; type II, incidence of disease 0.5 per thousand, of negative reactors 11 per thousand). The tissues of 14 individuals who had died from causes other than pneumonia were examined for the presence of polysaccharide antigen; the antigen was found in 11 individuals.

F. speculates whether the presence of the pneumococcal antigen in the tissues might account for susceptibility to the disease.

—G. FULTON ROBERTS.

See also absts. 854-855 (BCG); 856 (P.P.D.); 859 (Johne's disease); 860 (s. *erysipelas*); 869 (pullorum disease); 870 (brucellosis); 911 (allergic encephalitis); 922-923 (distemper); 930 (Newcastle disease); 938 (psittacosis); 941 (rickettsia); 1083 (serum albumin); 1084 (anaphylactic shock); 1162 (Wetmann reaction); 1173 (boob, rabies).

PARASITES IN RELATION TO DISEASE [GENERAL]

GARDINER, J. L., & WEHR, E. E. (1949.) Some parasites of the wild turkey (*Meleagris gallopavo silvestris*) in Maryland.—*Proc. helminth. Soc. Wash.* 16. 16-19. 963

The following parasite species were identified from two wild turkeys from a flock affected with sinusitis :—ACARINA : *Megninia cubitalis* ; CES-

TODA : *Raillietina williamsi* ; *Raillietina cesticillus* ; *Davainea meleagridis*. NEMATODA : *Trichostrongylus tenuis* ; *Capillaria longicollis* ; and many immature ascarids.

Practical control measures against these parasites are briefly discussed.—F. S. McC.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

WIGGLESWORTH, V. B. (1948.) The insect cuticle.—*Biol. Rev.* 23. 408-451. [Author's summary slightly modified.] 964

The cuticle consists of a relatively soft and colourless endocuticle, hardened and darkened in its outer part in some places to form a rigid exocuticle, and a complex epicuticle made up of several layers. The endocuticle consists of polyacetyl-glucosamine (chitin) intimately associated with a characteristic protein (arthropodin). Perhaps these are combined in the form of a mucoprotein in which the relative amounts of protein and polysaccharide vary with the type of animal and with the part of the body. The substance of the endocuticle separates, apparently spontaneously, into laminae of varying dimensions. In most insects the submicroscopic crystallites of chitin, and perhaps protein, tend to lie at random with the long axis in the plane of the cuticle. They can be orientated by tension or compression.

In the exocuticle the protein is tanned by quinones derived by oxidation from dihydroxyphenols. This tanned protein (sclerotin) impregnates the chitin framework to form a rigid fabric (like cellulose impregnated with a resin plastic) which is moderately impermeable to water. Hard cuticles in insects are always dark, largely because the quinonoid groups are chromophore, in part perhaps because during the oxidative hardening some true melanin is formed from tyrosine. In a few insects impregnation with lime takes the place of tanning. The cuticular substance has a tendency to crystallize in the form of multiple thin plates ; these are responsible for the iridescent colours of many insects.

The epicuticle is responsible for most of the impermeability to water. It consists of a thin layer of tanned lipoprotein (cuticulin), a layer of crystalline waxes about a quarter of a micron thick, and a layer of cement (likewise consisting, perhaps, of tanned protein containing some lipides) protecting the wax. The wax varies in character from a soft grease to hard white crystalline materials. If the temperature is raised to a critical level, some 5-10°C. below the melting-point of these waxes, the insect shows a sudden increase in the rate of transpiration. If the cement

and wax layer are abraded by fine dusts or removed by lipid solvents, the loss of water increases enormously. The properties of the epicuticular layers control to some extent the entry of insecticides through the cuticle.

In the deposition of the cuticle the cuticulin layer is first laid down ; the lipoproteins which compose it appear to come from the oenocytes. Formation of the endocuticle takes place around cytoplasmic filaments (the pore canals) which extend from the interior of the epidermal cells and appear to penetrate the cuticulin layer of the epicuticle. Droplets of material rich in polyphenols are exuded from the tips of the pore canals and fuse to form a continuous layer over the cuticulin. The wax is then secreted, during the last few hours before moulting, and covers the polyphenols. Almost immediately after moulting (in some insects before moulting) the cement is poured out from the dermal glands. The inner layers of the old cuticle are digested by enzymes contained in the moulting fluid and probably secreted by the general epidermis. The products are absorbed, together with almost all the fluid, before moulting occurs. Hardening and darkening take place after moulting as the result of the activities of the oxidative enzymes in the cuticle which convert the dihydroxyphenols into quinones. The function of the pore canals is probably to enable the epidermal cells to act at a distance upon the superficial layers of the cuticle. In some insects they still contain cytoplasmic filaments in the fully formed cuticle ; in others their contents are converted into chitin, into sclerotin, or a mixture of the two. The greater part of the endocuticle is laid down after moulting.

The integument of many insects remains alive. Removal of the wax and cement layers by gentle abrasion is repaired by the secretion of fresh wax. And in some forms water can be actively absorbed from the atmosphere even when this is far from being saturated with moisture.

USINGER, R. L. (1947.) Native hosts of the Mexican chicken bug, *Haematosiphon inodora* (Dugès) (Hemiptera, Cimicidae).—*Pan-Pacif. Ent.* 23. 140. [Abst. in *Rev. appl. Ent.* Ser. B. 37. 184. (1949), slightly amended.] 965

Haematosiphon inodorus, Dugès, a rather common pest of fowls in the southwestern United States and Mexico, has not previously been recorded from an indigenous host. Records are here given of the findings of a series of this species in a nest cave of the California condor (*Gymnogyps californianus*) in California in 1939 and of other collections from the nests of owls in California and Oklahoma in 1939-41. Fowls might easily become infested from these birds of prey, but the occurrence of related genera of Cimicids on swifts and martins suggests that a passerine host may yet be found for *Haematosiphon* from which it may be picked up by birds of prey.

HABERMAN, W. O., MORGAN, B. B., & DICKE, R. J. (1949.) **The occurrence of hypoderma larvae in the spinal canal of cattle.**—*J. agric. Res.* 78. 637-640. [Authors' summary slightly modified.] 966

The authors' observations on the occurrence of *Hypoderma bovis* in the spinal canal of cattle indicated a distinct difference in the migration route followed by the larvae of the two species. Only the larvae of *H. bovis* occurred regularly in the spinal canal whereas those of *H. lineatum* were rarely found in the spinal canal. On the other hand, only *H. lineatum* occurred regularly in the esophageal region. The increase in the average length of the larvae and in the number collected between September and June indicated that the larvae gradually accumulate in this region prior to appearing in the subdermal regions of the back.

NIŽNÁNSKY, F. (1949.) **Boj proti strečkovitosti hovädzieho dobytku s hl'adiska národohospodárskeho.** [The control of *Hypoderma* in cattle in Czechoslovakia.]—*Čas. československ. Vet.* 4. 73-87. 967

N. discusses the financial losses inflicted by *Hypoderma* spp. and methods of control employed in various countries and the biology and incidence of the parasite in Slovakia. In 1941 *Hypoderma* control was made compulsory by a special regulation. Trained personnel was provided by the ministry of agriculture to collect and destroy larvae systematically. Damage to hides as a result of this pest and loss of milk and meat was estimated at 25,000,000 crowns per annum [approx. £125,000]. About 30% of the cattle population is affected and it is hoped that this figure may be reduced to 5-10%.—E. G.

FURMAN, D. P., & DOUGLASS, J. R. (1948.) **Comparative evaluations of insecticides for cattle grub control.**—*J. econ. Ent.* 41. 783-787. [Authors' summary and conclusions copied verbatim.] 968

Several insecticides were tested for comparative kill of cattle grubs when applied as a spray at

350 to 400 pounds pressure. The data obtained divide the tested materials into effective and ineffective groups. The effective materials were: (1.) Standard rotenone-sulphur spray (10 pounds 5 per cent rotenone, 10 pounds wettable sulphur, 1 pint detergent, 100 gallons water). (2.) 10 pounds of 5 per cent rotenone to 100 gallons water. (3.) 7.5 pounds of 5 per cent rotenone to 100 gallons water. The following materials were ineffective: (4.) Eight pounds of benzene hexachloride 50 per cent wettable powder containing 5 per cent gamma isomer in the mix, and water 100 gallons. (5.) 2.5 quarts of 2.5 per cent rotenone as a liquid rotenone extract to 100 gallons water. (6.) Four pounds of 50 per cent wettable chlordan dust to 100 gallons of water. (7.) One gallon of 45 per cent emulsifiable concentrate of chlordan to 100 gallons of water.

Statistical analysis of the data on insecticidal activity of the three effective combinations tested demonstrated that in any critical test of an insecticide for cattle grubs the stage (fourth or fifth) and the species of grub must be recorded and considered. These tests indicated furthermore that fifth stage *Hypoderma bovis* are significantly more resistant than fifth stage *H. lineatum* to insecticide formulae numbers 1 and 3 as designated above.

Considered on the basis of over-all kill of all grubs the insecticidal activity of the rotenone sulphur mixture (insecticide formula 1) was not significantly different from that of 5 per cent rotenone at either 7.5 pounds or 10 pounds to 100 gallons of water. However, on the basis of comparative kills of fourth stage *Hypoderma lineatum* there are indications pointing to the superiority of the rotenone sulphur mixture over 5 per cent rotenone at 7.5 pounds to 100 gallons of water.

BELSCHNER, H. G. (1947.) **The buffalo fly: its southward advance and method of control.**—*Yearb. Inst. Insp. Stk N.S.W.* 1947. pp. 27-44. 969

This is a general discussion of the problems associated with the spread of *Siphona* (*Lyperosia*) *exigua* southwards from north Queensland. The economic importance of the buffalo fly is emphasized. Methods of control are discussed in some detail.—D. F. STEWART.

HEILESEN, B. (1949.) **Studies on mosquito bites.**—*Acta. allerg.* 2. 245-267. [In English. Author's conclusion and summary copied verbatim.] 970

Mosquito bites produce immediate and delayed reactions equivalent to those elicited by allergic intracutaneous tests. Hecht's and Mellanby's experimental studies support the view that the reactions of man to mosquito bites are due to a sensitization.

In the present experiments *Aedes aegypti* have been used. Experiments were made on the writer and 40 other persons, including 10 children. Repeated exposures and intracutaneous tests with extracts of mosquitoes have afforded further support for the theory of an allergic nature of the mosquito bites. The experiments also suggest the value of desensitizing therapy but only as far as the delayed reaction is concerned.

GRAHAM, N. P. H., & SCOTT, M. T. (1948.) Observations on the control of some ectoparasites of sheep. 2. Progress report on the use of DDT and benzene hexachloride for the control of the sheep ked (*Melophagus ovinus*) and the sheep body louse (*Damalinia ovis*).—*J. Coun. sci. industr. Res. Aust.* 21. 266–274. 971

D.D.T. was found, in preliminary trials, to be quite efficient against keds and lice in concentrations as low as 0.01% when single sheep were dipped. In field trials, using a proprietary paste, which, when melted and poured into water formed a fine suspension, a concentration of 0.1% was effective in both plunge dips and power spray units. Small-scale trials with benzene hexachloride were carried out against keds and lice, concentrations as low as 0.005% γ -isomer proving effective.

Both insecticides were non-toxic to ked pupae and lice eggs, but sufficient residual concentration remained in the fleece to kill parasites hatching from them. Owing to selective removal of these insecticides from the dip by the fleece the importance of maintaining the bath concentration is stressed. This "stripping" of the dip must be overcome by either higher initial concentrations or frequent additions of insecticide.—B. A. F.

PICARD, J. P., & KEARNS, C. W. (1949.) Analysis of the essential structural features of DDT by a study of the toxicity of closely related compounds to roaches and to houseflies.—*Canad. J. Res. Sect. D.* 27. 59–67. 972

Three series of compounds were prepared and evaluated on the small cockroach (*Blattella germanica*) and on houseflies. If the CHCl_3 portion of the D.D.T. molecule is replaced by CHOH and derivatives of each of these substances, containing fluorine, chlorine, bromine, methyl or methoxyl group are prepared, the derivatives of the second series appeared to be as toxic to male species of *B. germanica* as the corresponding D.D.T. analogue. The same was true of the analogue without substituent in either ring although a considerable decrease in activity was apparent. The benzophenone derivatives were tested at 10 times the concentration required by the corresponding hydrol to kill 50% of the

roaches and none showed any sign of activity. The benzophenone and benzohydrol derivatives were found to be ineffective at a concentration of 5 mg. per ml. as insecticidal sprays against houseflies. The 4,4'-dimethoxyl compound had a considerable "knockdown" effect but was slightly less effective than D.D.T.—R. GWATKIN.

GOULD, G. E. (1948.) The newer insecticides against roaches.—*Soap & Sanit. Chem.* 24. 147 & 149; 177 & 179. 973

It was found that, in concentrations given below, certain new insecticides gave a better kill of cockroaches than a 50% mixture of sodium fluoride, e.g. parathion (*o,o*-diethyl *o-p*-nitrophenyl thiophosphate) 0.25%, gammexane 2%, chlordane 2%, toxaphene 5%, azobenzene 20%, calcium dicyanamide 50% and D.D.T. 5%, the most outstanding of these being parathion which gave a 100% kill at a concentration of 0.25%. Many of these substances, however, have objectionable properties such as unpleasant odours and toxicity to higher animals, which makes them unsuitable for use in the home or near food. Additional studies are therefore necessary on the toxicity of toxaphene before it can be recommended for general use.—W. MOORE.

MUSGRAVE, A. J. (1946.) Entomology and the leather industry.—25th Anniv. Brit. Leather Man. Res. Ass. 2. pp. 473–485. 974

This is a general description, written for those interested. Most of the information, if not all, is well known to specialists.

A table is given of these destructive agents, showing those which operate by the effects of injury to the skin during life and also those which damage hides and skins, furs and leather respectively after these products are removed from the animals.

Certain relevant aspects of insect physiology are referred to and steps that can be taken to render these products unsuitable for the predators are discussed. Control of these predators is referred to in general terms.—G. M. URQUHART.

KONE, K. (1949.) Accidents mortels chez les zébus causés par des piqûres d'ornithodoros. [Fatal cases of tick paralysis in zebu cattle caused by bites from *Ornithodoros savignyi*.]—*Bull. Serv. Elev. Industr. anim. A.O.F.* 2. 25–26. 975

A herd of 98 indigenous cattle (bororodji breed) were brought for rinderpest immunization on to land heavily infested with *Ornithodoros savignyi*. The animals were tethered while awaiting immunization and some of the more intractable ones were cast. Four hours after arrival one animal went down and died. Its thorax and legs were covered with ticks. Within another

two hours nine more cattle died. All the animals were between 18 months and three years old.

The symptoms comprised irritation, thickening of the skin by the formation of oedematous plaques up to the size of the palm of a hand, prostration, decubitus and death. No characteristic lesion was seen P.M.

This is the first record of such an occurrence at N'Guigmi in spite of the fact that rinderpest inoculations are continually being carried out on the same piece of ground which is known to be heavily infested with *Ornithodoros*. The explanation may be that the animals are not normally tethered or cast. It also seems that the Bororodji type of cattle is particularly susceptible to *Ornithodoros* tick bites.—E. G. WHITE.

PIERCY, S. E. (1948.) **The control of dog ticks with gammexane and gamatox.**—*E. Afr. agric. J.* 13. 157-159. 976

Twenty-two dogs were washed in a solution containing 0.005% gammexane, prepared from a stock solution of 1% gammexane in toluol by dilution 1:20,000, at 10-14 day intervals. Later a 50 gal. tank was filled from a solution prepared from gamatox no. 2 paste containing 5% gammexane by mixing with water to contain 0.005% gammexane, and the dogs totally immersed every 7-10 days. This wash was renewed every three weeks. No toxic effects were observed. The ticks were not immediately killed, but they began to fall off a few hours after treatment, and by 24 hours the dogs were tick free. The residual effect remained for seven days after which ticks began to reappear. The efficiency of the tick control was reflected by the elimination of the tick-borne infection, *Rickettsia canis*, which was formerly prevalent in the kennels.—D. W. JOLLY.

SCHWARDT, H. H. (1949.) **Diagnosis and control of mange in dairy cattle.**—*J. econ. Ent.* 42. 444-446. 977

Incidence of cattle mange caused by *Sarcoptes scabiei caprae* and *Chorioptes bovis* appears to be

See also absts. 929 (mites and Newcastle disease); 941 (rickettsia and ticks); 944 (Q fever and ticks); 963 (mites in wild turkeys); 1136 (ticks, microscopy); 1152 (aerosols); 1168 (Brit. W. Indies, report).

steadily increasing in north eastern parts of the U.S.A., but is confined mainly to milking herds. Diagnosis was made by differential centrifugal flotation of mites in a sucrose solution, after preliminary maceration in potassium on sodium hydroxide. A satisfactory method of spraying cattle is described and good results are claimed following the use of lime-sulphur solution, wettable sulphur, wettable sulphur with rotenone, or benzene hexachloride. The tests were field trials and exact data on the efficacy of the various materials were not obtained.—G. B. S. HEATH.

LAURANS, R., & WILCZYNSKA, H. (1948.) **Le sulfure de polychlorocyclane en solution dans l'alcool terpenique dans la lutte contre la gale sarcoptique du chien. [The sulphide of a polychloro-aromatic-hydrocarbon dissolved in alcohol containing terpenes in the control of sarcoptic mange in dogs.]**—*Bull. Soc. Path. exot.* 41. 601-604. 978

Four to five applications of a 2% aqueous solution of a mixture of 18% aromatic sulphur compound in terpene alcohol and lauryl alcohol, as a wetting agent, were made at intervals of about seven days on dogs with sarcoptic mange. Clinical symptoms disappeared after the second application and hair growth began. It was non-toxic in the concentrations used and did not cause skin irritation or retard wound healing. It had the additional advantage of cheapness.—G. V. LAUGIER.

PHILIPPE, J. (1948.) **Note sur les gales du singe. [Mange in monkeys.]**—*Bull. Soc. Path. exot.* 41. 597-600. 979

The occurrence of sarcoptic mange in some green monkeys (*Cercopithecus aethiops*) and baboons (*Papio papio papio*) is described. P. considered that the presence of suckers on both posterior legs in both males and females was a sufficiently distinctive character to justify the creation of a new species, which he named *Sarcoptes pitheci* n.sp.—M. L. CLARKE.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

CHANDLER, A. C. (1948.) **Factors modifying host resistance to helminthic infections.**—*Proc. 4th Internat. Congr. Trop. Med. Malar.* pp. 975-988. 980

C. employs the term resistance as including any mechanism, specific or non-specific, which adversely affects the parasite. The term immunity is applied only to resistance which involves the production of antibodies, whereas other forms of resistance are termed environmental. He distinguishes between local and general immunity,

the former being characterized by a local antigenic stimulation at the site of the parasite and the latter by a widespread antigenic stimulation. Helminths which live in the lumen of the intestine, but which to some extent injure the tissues locally, i.e., most trematodes and intestinal nematodes, stimulate the former kind while helminths which have a parenteral phase, e.g. schistosomes, larval cestodes and certain nematodes stimulate the latter kind of immunity. In both cases the result is the formation of antibodies and a resistance to re-infection.

Helminths which do not come into intimate contact with the host's tissues, such as adult cestodes and acanthocephala would not be expected to promote immunity in the sense in which *C.* uses the word. Regarding the mechanism of immunity he points out that the effective antigens are the worm's metabolic products and that for the production of antibodies, these products should come into intimate contact with the host's tissues. He discusses also the influence of non-specific factors in resistance. Deficiency of vitamins A and B, certain minerals, and protein, probably adversely affect resistance; resistance increases with advancing age and individual variations in resistance commonly occur. While the above environmental factors together with the immunological mechanisms influence the degree of infection with those helminths, the metabolic products of which come into intimate contact with the host's tissues, the factors influencing infection with acanthocephala and adult cestodes are different. As for the acanthocephala, *C.* concludes from his own observations that they require a certain favourable zone in the intestine and that their success depends on their establishing themselves in this location. With the cestodes he considers that competition for space and food is an important limiting factor in their development. There appears to be little evidence of age resistance to adult cestodes and the effect of starvation in infection with acanthocephala and adult cestodes is to cause their elimination. In the case of cestodes this may result from their high carbohydrate requirements.—J. F. A. SPRENT.

VAN SOMEREN, V. D. (1946.) **The habitats and tolerance ranges of *Lymnaea (Radix) caillaudi*, the intermediate snail host of liver fluke in East Africa.**—*J. Anim. Ecol.* 15. 170-197. [Abst. from author's summary.] 981

Lymnaea caillaudi Bgt. is the principal and most efficient vector of fascioliasis in East Africa. It has a wide distribution in parts of Africa. The various types of aquatic habitats available in East Africa are described.

The hydrogen-ion concentration of the water has little effect on the distribution of the snail, but the optimum range is pH 6.5-8.0. The total hardness of the water has little effect on it, but the lower toleration limit is probably about 8 p.p.m. CaCO_3 . In Kenya Colony, the water in a good habitat is usually clear, clean, permanent, shallow and with a slight current. Ferruginous waters are unfavourable. The oxygen tension of the water is probably the chief limiting factor and should preferably not fall below 75% saturation.

Sunlight and lack of intensive organic pollution are essential in a good habitat. The nature of the soil requirements and of the plant life that

occurs in suitable environments is discussed.

At times the snail is amphibious, but is not found away from moisture even when out of water.

ANDERSEN, D. A. (1945.) **Hydatid cysts. A clinical study of a short series.**—*Indian med. Gaz.* 80. 373-377. 982

A record of ten cases of hydatid cyst in human beings.—H. D. SRIVASTAVA.

BROWN, M., CRONK, B., DESINER, F., GREEN, J. E., GIBBONS, J. E., & KUITUNEN-EKBAUM, E. (1949.) **A note on trichinosis in animals of the Canadian Northwest Territories.**—*Canad. J. publ. Hlth.* 40. 20-21. 983

When diaphragms, masseter and other muscles from six seals, seven walrus, nine whales and three polar bears were examined for trichinosis, two bears were found to be infected. These examinations were made because illness suggestive of trichinosis had occurred in natives of Southamp-ton Island, N.W.T.—J. FRANK.

GURSCH, O. F. (1949.) **Intestinal phase of *Trichinella spiralis* (Owen, 1835) Railliet, 1895.**—*J. Parasit.* 35. 19-26. 984

G. infected rats with larvae of *T. spiralis*, killed them at various times after infection and examined their intestines for adult parasites. In the first 24 hours of infection almost half of the ingested larvae were lost; after this time, up to the ninth day the infection was stabilized and after nine days the adult parasites were rapidly eliminated. Irrespective of the time after infection or the initial dose of larvae the greatest number of worms occurred in the first quarter of the small intestine. Penetration of the mucosa of the small intestine was evident within two hours of infection, but at 20 hours the worms had returned again to the lumen, possibly for copulation. After two days most of the worms were back in the mucosa, where they apparently do extensive damage. From the second to the ninth day the sex ratio was 2 females : 1 male, but by the 14th day it was 1 : 1. —J. F. A. SPRENT.

NIVERD, C. (1947.) **Traitement de la strongylose pulmonaire bovine par les injections intratrachéales de tétrachlorure de carbone en émulsion huileuse. [Treatment of lungworms in cattle by injection of carbon tetrachloride.]**—*Thesis, Alfort.* pp. 58. 985

Half of this thesis is devoted to a general review of *Dictyocaulus viviparus* infection in cattle, a description of the clinical signs, and an historical survey of the various drugs and modes of treatment which have been used in the past.

In the remaining part the author records the result of treating about 300 cattle with intratracheal injections of carbon tetrachloride in olive oil (1 ml. CCl_4 per 3 ml. oil). A dose of 10 ml.

of solution was given three times, with an interval of 2-5 days between the first two injections, and 4-8 days between the second and third. It is stated that some coughing and respiratory distress occurred but only for 1-2 min. after the injections. R. considered that the treatment was useful.

—M. L. CLARKE.

DE LA TORRE MONTOYA, A. (1946.) La fenotiazina en el tratamiento de la bronquitis verminosa de los bovinos (1). [**Phenothiazine in the treatment of verminous bronchitis in cattle.**]

—*Rev. Med. vet., Bogotá*. 15. 81-96. 986

The author gives a general account of lungworm (*Dictyocaulus viviparus*) disease in cattle in Colombia and of the treatment of the seriously affected cattle on eight farms, groups of cattle being treated and other cattle left untreated as controls. Phenothiazine, finely ground in a mortar, and added to a mixture of equal parts of alcohol and glycerin in the proportion of 20 g. in 100 ml. (200 mg. of phenothiazine per ml.), was injected intratracheally in doses of 3-5 ml. for calves up to six months old, 10 ml. for those from 6-12 months old and 15 ml. for full-grown cattle; the dose was usually repeated three or four times at intervals of 8-10 days.

The results were excellent in that practically all the treated animals quickly responded and recovered whilst the controls became worse and died. A few treated cattle were examined at the Veterinary College at Bogotá, and the common finding was that their lungs were free from worms either living or dead.—J. E.

BARON, J. (1946.) *Aelurostrongylus abstrusus*.

[***Aelurostrongylus abstrusus* infection of cats.**]

—*Thesis, Alfort*. pp. 134. 987

It is noted that infection in France is general with a particular focus in the Paris region and that it often appears to coexist with notoedric mange. The literature is reviewed.—G. V. LAUGIER.

NAERLAND, G. (1948.) Den gastro-intestinale snylterplage hos sauen (fåret). I. Bemærkninger vedrørende snylterdiagnostikken og den anthelmintiske forsøks-teknikk samt tallmessig oversikt over mage-tarmnematodene hos sau (og geit) under forskjellige aldre og beitetilhøve. [**Helminth parasites in sheep. I. Diagnosis and anthelmintic test technique and survey of nematodes in sheep and goats.**]

—*Skand. Vet-Tidskr.* 38. 529-566. [English summary.] 988

The differential worm count method as described by Taylor has been tried and found indispensable for an accurate diagnosis of mixed nematode infestations in sheep and in experimental work on anthelmintics. Records are given, covering a period of four successive years, of the species of nematodes and their respective numbers

in 64 untreated lambs, 21 adult sheep and three goats. *Moniezia*, species of lungworms and liver flukes were all present simultaneously. Most of the lambs and sheep examined were from the same, self-maintained, flock and had either served as controls in anthelmintic trials or were ordinary slaughter animals. Of these only one or two had symptoms of parasitic disease. The survey demonstrated the "normal" worm burden of sheep of this particular flock which, however, may be considered a typical one of the coastal areas of Western Norway characterized by humid and moderately temperate climatic conditions.

The records reveal that the composition of the nematode fauna of sheep of the same age and belonging to the same flock varies considerably from animal to animal and even between twins. The worm burden of lambs killed in October-November was substantially heavier in those grazed on reclaimed farm land than in those grazed away on mountain grazings during the mid-summer months, proving the more heavily stocked home grazings to be the main source of infection and that under such climatic conditions no serious infection takes place on such pastures early in the season, previous to the departure for the mountain grazing at about middle to end of June. Exceptions to this rule are, however, infestation with *Moniezia*, *Ostertagia*, *Nematodirus*, *Strongyloides* and *Trichuris*, the pre-parasitic stages of which are presumably the most capable of surviving the winter on pasture. Further, it appears that the nematode fauna of adult, apparently healthy sheep of such a flock is essentially different from that of the lambs as to species as well as individual numbers, the adults regularly harbouring fewer species, mainly *Trichostrongylus* spp. and *Bunostomum*, and as a rule in quite insignificant numbers. Individual lack of constitutional vigour of the host, e.g., because of shortage of milk, unsuitable or insufficient grazing facilities, joint ill or other chronic infection, dietary deficiencies, etc., is invariably accompanied by an increased gastrointestinal worm burden, not infrequently with an additional lungworm infestation, rendering it extremely difficult to decide what are the primary and/or the secondary factors. In such circumstances adult sheep seem to fall back into the state of susceptibility to nematode invasion of their youth. The ratio, total number of worms: EPG (eggs per g. of faeces), which in October-December averages about 4, gradually increases during the winter months, when no apparent re-infection takes place, reaching 20 or more in April in thriving lambs which are gaining in weight during the period when they are usually temporarily housed and fed by hand. This increase in ratio together with an actual drop in

the egg output of the parasites in lambs on a sufficient winter ration indicates that some sort of "self-elimination" and/or decline in the egg laying capacity of the female nematodes takes place during the winter months.—G. NAERLAND.

SARWAR, M. M. (1946.) Two species of the nematode genus *Setaria* Vidborg.—*Indian vet. J.* 22. 405-409. 989

*The validity of *Setaria digitata* has been
See also abst. 963 (nematodes and cestodes in wild turkeys).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

WEIS, J. (1946.) Lymphogranuloma malignum u koně. [Malignant lymphogranuloma in a horse].—*Čas. československ. Vet.* 1. 399-401. 990

W. reports on a case of malignant lymphogranuloma in a four-year-old horse, which had had fever with loss of appetite and general condition for about a month before slaughter. P.M. there was great enlargement of both the spleen and liver. All the lymph nodes of the abdominal cavity were enlarged. Histologically the lesion was described as malignant lymphogranuloma, the condition resembling Hodgkin's disease. On account of the wide involvement of lymph nodes and extensive metastases in the spleen, liver and peritoneal cavity the primary infective organism could not be ascertained.—E. PŘIBYL.

MATZKE, M. (1948.) Sarkoide der Haut beim Pferde. [Sarcoids of the skin in horses].—*Dtsch. tierärztl. Wschr.* 55. 69-71. 991

M. states that histologically the tumours bore resemblances to papilloma-fibroma-sarcoma. He uses the name sarcoid. Good illustrations are given.—J. E.

SCHOFIELD, F. W. (1949.) Carcinoma of the adrenal cortex in cattle (hypernephroma).—*Canad. J. comp. Med.* 13. 252-255. 992

This tumour occurs not infrequently especially in cattle, occasionally in other animals such as pigs. It varies from the size of a pea to that of a man's head. The shape is round or oval and the consistency soft and friable. The colour is variegated; dark red areas are due to haemorrhage and yellow to lipoidal substances in the cells. It is not highly malignant, metastasis sometimes occurs in the liver. There is a tendency for solid masses of the tumour cells to be attached to the atrophied remains of the adrenal gland.

There is variation in the morphology of the cells. They usually have a pale, vesicular nucleus surrounded by a poorly staining vacuolated cytoplasm. Usually the growth is densely cellular, but sparsely cellular regions do occur. In some

discussed by various workers and by some it has been considered a synonym of *S. cervi*. From his studies of specimens from buffaloes and cattle, S. considers them to be distinct species, the distinctive features being the shape of certain parts of the peribuccal ring, the size and disposition of teeth and the shape of the appendages and caudal endings. The occurrence of a single female specimen of *S. cervi* in a sheep is recorded.

—H. D. SRIVASTAVA.

instances the cells develop an alveolar arrangement, occasionally papillary formations occur. Haemorrhages frequently occur in this tumour. Fibrous tissue in coarse bundles or in fine strands is irregularly distributed throughout the growth.

While this tumour resembles the growth in man known as hypernephroma, in the ox it occurs almost always as a primary of the adrenal cortex. For this reason S. suggests that the designation applied by Feldman, "carcinoma of the adrenal" be adopted.—P. J. G. PLUMMER.

SCHOUR, I., BHASKAR, S. N., GREEP, R. O., & WEINMANN, J. P. (1949.) Odontome-like formations in a mutant strain of rats.—*Amer. J. Anat.* 85. 73-111. [Authors' summary and conclusions copied *verbatim*.] 993

This study is based on the roentgenologic and histologic investigation of the dentition and the alveolar process of 47 "incisorless" (*ia*) and 18 control rats. Their ages ranged from 14 days insemination age to 660 days after birth.

The *ia* rats showed the following characteristic alterations: (1) Malformation and failure of eruption of the incisors and molars. (2) Development of odontome-like formations, consisting of all the components of teeth and bone, in the premaxilla, maxilla and the body of the mandible.

The following sequence of events led to the formation of the dental anomalies: (1) Tooth development was normal prior to the formation of the alveolar crypt. (2) The bony crypt, which normally grows by resorption on its dental surface and by apposition on its outer surface, failed to accommodate the growing tooth germs because of the lack of physiologic resorption of the bone tissue. (3) The epithelium of the enamel organ invaded the bone marrow spaces. (4) Ectopic formation of dentin, enamel and cementum in the marrow spaces led to ankylosis, lack of eruption and the formation of odontome-like structures.

GROSS, L. (1946.) The possibility of exterminating mammary carcinoma in mice by a simple preventive measure. Its practical implications

for human pathology.—*N.Y. St. J. Med.* 46. 172-176. [Author's summary slightly amended.] 994

Recent experiments leave no doubt that mammary carcinoma of mice, a disease very similar to, if not identical with, breast cancer in women, is communicable from one generation to another through the milk of nursing mothers. Animals transmitting the disease appear to be in perfect health at the time they nurse their offspring, and do not display any symptoms of tumors until they reach the "tumor age". The agent transmitted in milk and responsible for the development of tumors has the characteristics of a virus: it is filterable, and can be destroyed by heat. The development of mammary carcinoma can be entirely avoided in susceptible mice by preventing the new-born animals from being suckled by their potentially cancerous mothers, and transferring the offspring for the purpose of nursing to females whose milk is free from the cancer agent.

A working hypothesis is advanced suggesting that human tumors may be similar to those of mice, and that breast cancer of women may perhaps be communicated from one generation to another through the milk of nursing mothers. The nursing women may be in perfect health at the time they transmit the disease; and yet they may carry the tumor agent, and be therefore responsible for the development of breast cancers in their daughters later in life. It is therefore suggested that women of families with any malignant tumors in their ancestry refrain entirely from nursing their children. Since no more than a few hours of breast feeding may suffice to transmit the tumor agent, breast feeding should be abandoned in such families from birth, and artificial feeding substituted. Feeding of pasteurized human milk should also be considered; a brief boiling of human milk, such as is routinely done in certain milk banks, would serve the same purpose.

This simple preventive measure may save many human lives. The results will not become evident, however, until the next generation reaches the tumor age.

See also abst. 1033 (eosinophile skin granuloma).

WATERS, N. F., & BYWATERS, J. H. (1949.) Influence of age of chickens at contact exposure on incidence of lymphomatosis.—*Poult. Sci.* 28. 254-261. 995

Experimental data are presented which support WATERS [see *V. B.* 16. 268 & 18. 461] using the same line of White Leghorns, that lymphomatosis is a communicable disease and that the incidence is dependent on the age of chicks at the time of exposure, the degree of exposure and the genetic resistance.

The work now reported indicated that the agent of lymphomatosis is transmitted from contaminated chicks to susceptible ones at hatching time. Chickens exposed at 30 days of age had a lower mortality than their sibs exposed as day-old chicks.—D. LUKE.

LUCAS, A. M., & BREITMAYER, J. B. (1949.) Lymphoid tissue and its relation to so-called normal lymphoid foci and to lymphomatosis. III. Qualitative and quantitative comparison of lymphoid areas in the pancreas of the white Pekin duck with those in chickens.—*Poult. Sci.* 28. 436-445. 996

Pancreatic tissues from 49 ducks were examined histologically, special attention being given to the lymphoid areas. Histologically there was a great similarity between the pancreas of the duck and that of the fowl. Focal lymphoid areas were seen with damage to adjacent tissues similar to that found in fowls affected with lymphomatosis. It has been suggested that a diagnosis of lymphomatosis in fowls can be made when the lymphoid tissue comprises more than 1% of the pancreas. In the duck samples studied there was less than 1% of lymphoid tissue.—D. LUKE.

BLOMBERG, H. (1949.) Ett fall av neurolymfomatosis hos svan. [*Neurolymphomatosis in a swan.*]—*Nord. Vet.-Med.* 1. 719-725. 997

In a swan which died following the appearance of lameness in the left leg and a dropped left wing there was evidence of cellular infiltration in the axillary plexus and in the sciatic nerve. A diagnosis of neuro-lymphomatosis was made.

—D. LUKE.

NUTRITIONAL AND METABOLIC DISORDERS

SMITH, R. F., HOSKINS, W. M., & FULLMER, O. H. (1948.) Secretion of DDT in milk of dairy cows fed low-residue alfalfa hay.—*J. econ. Ent.* 41. 759-763. [Authors' summary copied verbatim.] 998

Seven dairy cows were fed alfalfa hay which had been sprayed, 10 days before cutting, with 0.25 pound of actual DDT in 5 gallons of water

per acre. The residue on the hay during feeding averaged between 7 and 8 ppm. The feeding continued for approximately three months. After the first few days the amount of DDT in the milk remained steadily at about 2.3 to 3.0 ppm. Butter made from this milk was found to contain 65 ppm of DDT. When half of the feed was replaced with untreated hay, the output of DDT in the

milk soon decreased to about two-thirds the former value. There were no apparent external symptoms in the cows nor was the milk production affected. More information is needed on the effect of low rates of feeding, type of ration, butterfat production, type of cow, and the fate of DDT in the cow.

TRIBE, D. E., & TRIBE, E. M. (1949.) **Sheep-grazing of seaweed. Observations on North Ronaldshay, Orkney Is.**—*Agriculture, Lond.* 56. 416-419. [Authors' summary copied *verbatim*.] 999

The Orkney sheep found on North Ronaldshay subsist entirely on seaweed. They are vigorous and healthy animals, and show no clinical symptoms of any nutritional deficiency. Seaweed of the order *Laminariales* forms the bulk of the diet, although a large variety of other red, green and brown weeds are eaten to a much less extent. The most palatable species are: (a) *Rhodomenia palmata*; (b) *Chondrus crispus* and *Gigartina mamillata*; (c) *Laminaria digitata*—particularly at the junction of the stipe and frond. The fauna associated with the seaweed are also of nutritional significance.

MENG, H. C., & EARLY, F. (1949.) **Study of complete parenteral alimentation on dogs.**—*J. Lab. clin. Med.* 34. 1121-1132. [Authors' summary and conclusions copied *verbatim*.] 1000

Dogs have been maintained for as long as four weeks on a diet administered exclusively by vein. The diet furnished proportional amounts of carbohydrate, protein, fat, minerals, and vitamins. Thirty-four per cent of the caloric content of the diet was furnished by a special fat emulsion. The dogs remained healthy, lively, and in good spirits throughout, and most of them gained weight. Extensive physiologic tests during the course of the experiments, and a complete histologic study following sacrifice, failed to reveal any significant abnormalities attributable to the procedure.

One dog was given the same treatment as the others except that the fat was omitted from the diet. It lost 14 per cent of its initial weight, appeared apathetic and emaciated, and developed lesions suggestive of a fatty acid deficiency. The behaviour of this dog gives considerable confidence to the belief that the injected fat in the other dogs was fully utilized, and that its presence in the medium enhances the value.

It is concluded that this emulsion could be used clinically with considerable confidence, and that it would be very beneficial in cases where complete parenteral alimentation is necessary.

GURD, F. N., & VARS, H. M. (1949.) **Pathologic changes after partial hepatectomy.** With

special reference to hepatic necrosis of protein-depleted rats.—*Arch. Path.* 48. 140-149. [Authors' summary copied *verbatim*.] 1001

Pathologic changes observed in the livers of 280 rats which were submitted to partial hepatectomy are reported.

A massive hemorrhagic necrosis of the liver is described, which occurred during the second day after operation in animals which had been previously partially depleted of protein through being restricted to a nonprotein diet for fourteen days. The livers involved in this necrosis showed failure of the usual regenerative response. Mitotic activity was conspicuously absent, and fragmentary analyses suggested that the regeneration of new liver protein was retarded.

Evidence has been discussed to support the hypothesis that the functional liver tissue remaining in the protein-depleted rats after 70 per cent hepatectomy was inadequate to support life and that survival was conditional on a prompt regenerative response.

Some observations on the gross and histologic changes in the thymus, the kidneys, the adrenal glands and the laparotomy wounds are also included. A rapid involution of the thymus was noted in protein-depleted rats after partial hepatectomy.

KUIKEN, K. A., & PEARSON, P. B. (1949.) **The essential amino acid (except tryptophan) content of colostrum and milk of the cow and ewe.**—*J. Nutrit.* 39. 167-176. [Authors' summary copied *verbatim*.] 1002

Colostrum and milk of the cow and ewe were assayed for arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine and valine by microbiological methods. The milk protein from both species contained about 1.4 times as much methionine as the protein of colostrum, but only 0.6 times as much threonine. Much smaller differences were noted in the relative proportions of the other amino acids. The amino acid patterns of the milk and colostrum of the two species are very similar.

FINCH, C. A., WOLFF, J. A., RATH, C. E., & FLUHARTY, R. G. (1949.) **Iron metabolism. Erythrocyte iron turnover.**—*J. Lab. clin. Med.* 34. 1480-1490. [Authors' conclusions copied *verbatim*.] 1003

The reutilization of radioactive iron from broken down red cells is effectively blocked by the presence of enlarged iron stores and/or bone marrow dysfunction in animals and in human subjects. By using recipients with these characteristics, the erythrocyte unit of iron metabolism may be isolated. Under these experimental conditions it was possible to measure the life span of

a red cell population of a single age. Observations were made of tagged macrocytes, microcytes, and normal red cells in normal and anemic recipients. The reticulocytes from a patient with pernicious anemia responding to therapy and from a patient with iron deficiency have been shown to have a relatively normal life span.

The erythrocyte iron turnover measured directly is approximately 1 per cent a day in dog and in man. There is no discernible exchange of iron between the red cell and its surroundings throughout the life span of the erythrocyte.

LOUW, P. G. J. (1948.) **On the availability of phosphorus in bonemeal, bonemeal supplemented with red oxide of iron, and boneash to white rats.**—*Onderstepoort J. vet. Sci.* 23. 261–267. 1004

Two experiments were carried out with albino rats to compare the availability of P in the three dietary supplements. Ca and P determinations were made on whole rats and isolated femurs at the beginning and after 42 days on the experimental diet. In the preliminary experiment P was supplied at a level of 0.23 %, with a Ca : P ratio of 2 : 1. This resulted in a low P retention. In the second experiment the P level was 0.16 %, and the Ca : P ratio 1.87 : 1, and the P retention was much higher. No significant difference in P retention with the three diets could be found in either experiment by analysis of variance.

—A. G. SINGLETON.

KEENER, H. A., PERCIVAL, G. P., MORROW, K. S., & ELLIS, G. H. (1949.) **Cobalt tolerance in young dairy cattle.**—*J. Dairy Sci.* 32. 527–538. 1005

Eleven calves, all less than a year old were given varying amounts of cobalt sulphate (10–100 mg. of cobalt per day per 100 lb. body weight) in their drinking water. The length of supplementary feeding varied from animal to animal, but many of them received additional cobalt for several months. Although there was a considerable individual variation in the tolerance level, generally the daily consumption of 50 mg. of cobalt per 100 lb. body weight proved harmless and hence the authors consider that the practice of adding 2 g. cobalt sulphate per ton of feed allows a wide margin of safety. The oral consumption of great excess of cobalt resulted in an increase in haemoglobin and packed red cell volume; loss of appetite, decreased water consumption, rough hair coat and a lack of muscular coordination were also noted.—E. EDEN.

MARSTON, H. R., & LEE, H. J. (1949.) **Primary site of the action of cobalt in ruminants.** [Correspondence.]—*Nature, Lond.* 164. 529–530. 1006

It is well known that the symptoms of Coast disease of sheep in Southern Australia are dramatically improved on giving cobalt *per os*. Further studies have proved that cobalt introduced parenterally is of no value and that sheep may develop the disease even when the cobalt content of the liver is within the normal range. Since only ruminants are affected, it is suggested that cobalt is in some way concerned with the activities of the ruminal flora. The anaemia of Coast disease does not respond to concentrated liver extracts nor to crystalline vitamin B₁₂ so that cobalt must have some wider physiological function than the part it plays during the maturation of the erythrocytes.—J. A. NICHOLSON.

SEBRELL, W. H. (1949.) **Iodine—a food essential.**—*Publ. Hlth Rep., Wash.* 64. 1076–1087. 1007

A short discussion is given on the structure of the thyroid gland and the function of iodine in the body. Symptoms of iodine deficiency and hyperthyroidism are also described. S. recommends a daily intake of 0.15–0.8 mg. of iodine. As the food consumed does not always contain this amount, potassium or sodium iodide (0.01 %) may be added to all table salt, this addition being safe even for patients with toxic goitre. Since the use of iodized salt, the incidence of goitre has been reduced in many areas of the U.S.A. In other areas goitre is still prevalent, hence the wider use of iodized salt is advocated.—E. EDEN.

WEISS, K. (1948.) **Durch Jodmangel bedingte Erkrankungen bei Ferkeln. [Diseases of young pigs caused by iodine deficiency.]**—*Wien. tierärztl. Mschr.* 35. 25–33. 1008

W. describes 11 instances in which young pigs which died shortly after birth had an enlargement of the head and neck region (goitre). This condition results from a lack of iodine and can be successfully prevented by the addition of five drops of tincture of iodine to the daily ration of the sow starting two months before parturition. The new-born pigs can be treated with "yatren" or other iodine compound.—R. ROSS-RAHTE.

FREY, P. R., & JENSEN, R. (1946.) **Depletion of hepatic reserves of vitamin A and carotene in cattle.**—*J. Nutrit.* 32. 139–141. 1009

Two groups of steers, which had acquired an initial high hepatic reserve of vitamin A and carotene, were fed respectively on a fattening ration relatively low and a maintenance ration relatively high in content of these factors. On both rations the hepatic reserves of both vitamin A and carotene fell, though the fall in vitamin A was more rapid than the fall in carotene. On the maintenance ration the fall was less rapid than on the fattening ration.—R. MARSHALL.

BECK, H., COLLINS, D. A., & FREYTAG, R. M.

(1946.) **Changes in the oral structures in the dog persisting after chronic overdoses of vitamin D.**—*Amer. J. Orthodont. Oral Surg.* Orthodont. Sect. 32. 463-471. 1010

Four puppies two months old were given large doses of vitamins D₂ and D₃ for a period of about five months. The overdosing resulted in deformed roots of the teeth, calcified connective tissue of the parodontium, hypercementosis, pulp stone formation and advanced parodontosis. The changes in the tissues were permanent and did not improve after long periods on normal diet.

The authors emphasize the danger of excessive doses of vitamin D.—E. G.

WHITING, F., & LOOSLI, J. K. (1948.) **The placental and mammary transfer of tocopherols (vitamin E) in sheep, goats and swine.**—*J. Nutrit.* 36. 721-726. [Authors' summary copied *verbatim*.] 1011

The placental transfer and colostrum storage of total tocopherols was investigated in sheep, goats and swine. Supplementing the prepartum ration with 80 mg of mixed tocopherols per 100 lb. body weight slightly increased the liver storage of tocopherols in the newborn animal, but the increase was not statistically significant. A highly significant increase in the tocopherol content of the blood plasma of the lambs and kids resulted from the prepartum supplementation, but no increase was observed in swine. Prepartum supplementation caused a two-fold increase in the tocopherol content of the colostrum in all species. Colostrum contained three to 4 times as much tocopherol as the milk obtained from the same animals 4 days later.

ANON. (1949.) **Myocardial lesions in experimental vitamin E deficiency.**—*Nutr. Rev.* 7. 278-280. 1012

In rats with chronic vitamin E deficiency pigment globules appeared in the myocardium about the tenth month, followed by necrosis and fibrosis of the tissue. In rabbits inflammatory changes and calcification were also observed. In heifers electrocardiogram examinations were carried out periodically during the development of the deficiency. These indicated a gradual decreased functional activity of the myocardium. Abnormal electrocardiograms were also noted in rabbits with muscular dystrophy. Stringent and prolonged vitamin E deficiency is necessary to produce these lesions in experimental animals and there seems to be no conclusive evidence that human coronary disease is caused by the absence of this vitamin.—E. EDEN.

MOORE, T., & WANG, Y. L. (1947.) **Formation of fluorescent pigment in vitamin E deficiency.**—*Brit. J. Nutrit.* 1. 53-64. 1013

The chemical and physical properties are described of the brown pigment seen in the uterus, skeletal musculature and other tissues of rats on a vitamin E deficient diet with particular reference to the fluorescent properties. The fluorescence could be detected in the early stages of the deficiency before any evidence of pigmentation was visible. The authors consider that the pigmentation arises from the abnormal oxidation of protein.—D. LUKE.

MILLS, C. A. (1949.) **Bone marrow nutrition in relation to the phagocytic activity of blood granulocytes.**—*Blood.* 4. 150-159. [Authors' conclusions copied *verbatim*.] 1014

Deficiency of any of the B-vitamins (except inositol or p-aminobenzoic acid), vitamin C or of protein, leads to a reduction in phagocytic activity of the blood granulocytes in experimental animals. This effect of a faulty diet, or of a restoration to normal after a period of malnutrition, alters the phagocytic activity of circulating granulocytes only after a lag of two to three weeks, thus leading to the conclusion that these cells are susceptible to nutritional faults only during their early formative period in the marrow tissue.

RINEHART, J. F., FRIEDMAN, M., & GREENBERG, L. D. (1949.) **Effect of experimental thiamine deficiency on the nervous system of the rhesus monkey.**—*Arch. Path.* 48. 129-139. [Authors' summary slightly amended.] 1015

Feeding 7 rhesus monkeys with a thiamine-deficient diet with widely spaced small thiamine supplements resulted in bilateral symmetric areas of degeneration, observed most commonly in the corpus striatum and seen also in the globus pallidus, substantia nigra, mammillary bodies, corpora quadrigemina, cerebellar cortex and the nuclei of the third, sixth, eighth and tenth cranial nerves. Capillary and endothelial changes were a relatively late finding and were interpreted as an attempt at repair of the injury. Associated with these lesions were profound weakness, ataxia and occasional focal signs of cranial nerve weakness or hyperirritability. No clinical or histologic evidence of peripheral neuropathy or of degeneration of fibers of the spinal cord was observed.

LUDOVICI, P. P., AXELROD, A. E., & CARTER, B. B. (1949.) **Circulating antibodies in vitamin deficiency states. Pantothenic acid deficiency.**—*Proc. Soc. exp. Biol., N.Y.* 72. 81-83. [Authors' summary copied *verbatim*.] 1016

Hemagglutinin production in response to inoculation with human erythrocytes has been investigated in rats fed a pantothenic acid-deficient diet for 3, 5, and 7 weeks. "Paired-weighted" animals served as inanition controls.

Marked impairment of antibody response was observed in all pantothenic acid-deficient groups.

BECKER, D. E., SEDGWICK, S. E., & LOOSLI, J. K. (1949.) Vitamin B₁₂ and cobalt deficiency in sheep.—*Science*. 110. 71-72. 1017

Lambs with signs of cobalt deficiency were treated with vitamin B₁₂ for periods of 1-5 weeks. Four animals were injected twice a week intramuscularly (1-100 µg. crystalline vitamin B₁₂ per injection) and two other lambs were fed vitamin B₁₂ concentrate (30-240 µg. per week). There was no significant improvement in the haemoglobin levels or weight gains in any of the animals treated.—E. EDEN.

ANON. (1949.) Nutrition of the guinea pig.—*Nutr. Rev.* 7. 280-282. 1018

A synthetic ration, adequate in protein and all other known nutrients except vitamin B₁₂, was not satisfactory for the rearing of g. pigs, but rate of growth was improved by supplementing this ration with bulk producing materials such as cellulose, beet pulp, alfalfa meal, pectin or gum arabic. The latter proved to be the best of all these supplements, but its activity was destroyed on hydrolysis. The improved growth rate obtained by gum arabic could be enhanced by the addition of 2.5% potassium acetate and 0.5% magnesium oxide. The function of these factors is not known, but they may act by creating favourable conditions in the intestine for the growth of micro-organisms.—E. EDEN.

NICHOL, C. A., DIETRICH, L. S., ELVEHJEM, C. A., & HART, E. B. (1949.) Observations on folic acid deficiency in the chick in the presence of vitamin B₁₂.—*J. Nutrit.* 39. 287-298. [Authors' summary copied *verbatim*.] 1019

Folic acid deficiency in chicks fed a purified ration was accentuated by supplying vitamin B₁₂ as the crystalline material, by injection or as a concentrate added to the ration. Extended quivering wings, body tremors and complete paralysis developed in more than 50% of the chicks which received vitamin B₁₂. Treatment with folic acid caused complete disappearance of these symptoms within 24 hours. Injection of folic acid was more effective than oral administration. None of these symptoms developed in the control groups.

Vitamin B₁₂ increased the rate of growth of the folic acid deficient chicks but did not cause marked improvement in feathering. The addition of vitamin B₁₂ to a sucrose-casein purified ration containing 200 µg of folic acid per 100 gm caused a further significant increase in growth. The relation of folic acid and vitamin B₁₂ to the previously described vitamins B₁ and B₁₁ is briefly discussed.

MURRAY, P. D. F., & KODICEK, E. (1949.) Bones, muscles and vitamin C. III. Repair of the effects of total deprivation of vitamin C at the proximal ends of the tibia and fibula in guinea-pigs.—*J. Anat.* 83. 285-295. [Authors' summary copied *verbatim*.] 1020

When guinea-pigs were subjected to total deprivation of vitamin C they showed the classic changes and, since the proximal end of the tibial diaphysis was destroyed by repeated microfractures, the epiphyses came to overlap, both laterally and medially, the narrow zone of the tibial shaft now in contact with it. The damage to the diaphysis was usually greater medially than laterally, causing the epiphysis to slope downwards and medially, making the animals bow-legged.

When animals, in which these changes had occurred during a period of total deficiency, were again given the vitamin, reparative changes restored the tibia to a form approaching the normal. These changes were: (a) the formation of a sub-periosteal thickening in the widened periosteal cambium which filled the angle between the overhanging epiphysis above, the fibrous layer of the periosteum, and the old diaphyseal wall; (b) the formation, around the proximal end of the diaphysis, of cartilage derived from the periosteum, and its later replacement by endochondral bone which was added to (c) a trabecular bony callus developed endosteally; and (d) trabecular bone formed endochondrally at the growth cartilage. All these changes occurred in some cases, but not in every case, and there was great variation in detail.

ORTIZ DE LANDÁZURI, E., & GALDO SECO, A. (1949.) Observaciones en équidos de la fase de intervalo entre la administración de una dieta latirogena y el comienzo de la enfermedad. [Observations on Equidae of the interval between giving a diet that produces lathyrism and the appearance of the disease.]-*Rev. clin. española*. 32. 29-32. [Abst. in *Nutr. Abstr. Rev.* 19. 496. (1949), copied *verbatim*. Signed: M. B. RICHARDS.] 1021

An outbreak of lathyrism in horses in a province of Granada is reported. The animals had been fed for 97 days on a diet which included 2.6 kg. blue vetch and 1 kg. tares (yeros) per head daily. Four days after discontinuing this diet, when the animals were receiving only barley and straw, the first case of lathyrism occurred. Eventually 15 of 24 animals were affected, and the mortality was 25 per cent. The last case occurred 50 days after the vetch diet was discontinued. Hybrids seemed most susceptible to the disease, 14 of 16 mules being affected, but only 1 of 7 mares.

A similar delayed appearance of lathyrism was previously observed in human subjects.

DUFETRELLE, F. (1946.) Les névroses vitulaires. Etiopathogénie, étude clinique et traitement spécifique. [Milk fever, eclampsia and tetany in dairy cows.]—*Thesis, Alfort*. pp. 64. 1022

The milk fever syndrome is visualized as a series of acute hypocalcaemias associated with an upset in the sympathetic and parasympathetic balance. Each clinical manifestation is the reflection of the nervous tonus of the animal and is recognized by its degree of glycaemia. The greater the glycaemia, the graver the prognosis. Thus hypoglycaemia is a feature of milk fever, hyperglycaemia a feature of eclampsia. Treatment along classical lines was discussed, the importance of differential diagnosis being stressed.

—G. V. LAUGIER.

CHATELAIN, M. (1945.) La tétanie d'herbage dans l'espèce bovine. [Grass tetany in cattle.]—*Thesis, Alfort*. pp. 86. 1023

C. observed a considerable number of cases in the Cambresis district. The aetiology of the disease is reviewed together with predisposing factors such as pastures, atmospheric conditions and feeding. Early diagnosis and treatment are

See also absts. 1030 (proteins in swine dermatitis); 1042 (vitamin K); 1086 (vitamin A); 1120 (subterranean clover).

DISEASES, GENERAL

BRUER, G. (1948.) Idiopathische Kreuzlähme bei Pferden. [Idiopathic posterior paralysis in horses.]—*Tierärztl. Umsch.* 3. 167–170. 1025

B. suggests, but provides no evidence, that what is commonly referred to as idiopathic posterior paralysis in horses is caused by injury to the spinal cord in the region of the last lumbar vertebrae, of an as yet undefined nature.—E. G.

BRYAN, C. S. (1946.) Tyrothricin ointment in the treatment of udder and teat injuries.—*N. Amer. Vet.* 27. 628–632. 1026

B. studied the effects on the control of mastitis of treating 114 cows in 20 dairy herds affected with injuries and sores on the teats, using 0.05% of tyrothricin in an oil-in-water emulsion. Forty-eight cases of equal severity in the same herds served as controls and were merely washed with soap and water when dirty.

The ointment was applied after each milking and records were kept of the physical appearance of all wounds. Milk samples were examined monthly or when any case of acute mastitis developed. All types of wound (lacerations, tears, crushed teats, incised wounds) were treated and the speed of healing was very marked as compared with the controls. Although a slight increase (7.2%) was noted after using tyrothricin ointment,

regarded as essential. Relapses are not infrequent with sequelae in the locomotor and ocular systems. The bulk of the thesis comprises a review of existing knowledge and its application in this district.

—G. V. LAUGIER.

DETWEILER, D. K., & MARTIN, J. E. (1949.) The Sulkowitch test as a guide in the diagnosis and therapy of bovine hypocalcaemia.—*Amer. J. vet. Res.* 10. 201–207. 1024

The Sulkowitch test consists of adding to urine an equal volume of the reagent (containing oxalic acid, ammonium-oxalate and glacial acetic acid). The pH of this mixture is between 2.6–4.5 at which the precipitate obtained is mainly calcium oxalate and the degree of turbidity of the solution is considered by the authors to be a rough guide not only of the amount of calcium in the urine but also of that contained in the serum. The use of this test is recommended in the diagnosis of hypocalcaemia and also for the determination of the amount of calcium necessary to be injected intravenously, excessive doses thus being avoided. The authors emphasize that although the Sulkowitch test for calcium is very useful for quick diagnosis, the more accurate methods should be used in preference whenever possible.—E. EDEN.

See also absts. 1030 (proteins in swine dermatitis); 1042 (vitamin K); 1086 (vitamin A); 1120 (subterranean clover).

in the control group there was an increase of nearly 30% in those affected with chronic mastitis.—C. D. WILSON.

CANDLIN, F. T. (1949.) Sulfathalidine (phthalyl-sulfathiazole) in control of diarrhea in calves.—*J. Amer. vet. med. Ass.* 115. 261–262. [Author's summary copied verbatim.] 1027

Sulfathalidine (phthalylsulfathiazole) was used satisfactorily as a prophylactic agent for diarrhea in calves. One 4-Gm. bolet given daily for five days following birth proved to be a satisfactory dosage for controlling the disease. Calves showing evidence of the disease complex at birth were benefited by the administration of one 4-Gm. bolet of the drug three times a day.

TIMONEY, J. F. (1949.) Experimental production of oedema disease of swine. [Correspondence.]—*Vet. Rec.* 61. 710. 1028

T. records the successful production experimentally of 16 cases of oedema disease of swine by the intravenous inoculation of supernatant fluid from the centrifuged contents of the small intestine from an oedema case. It is suggested that these findings support the view that the condition is a specific bacterial toxæmia. On nine different farms in-contact experiments were carried out

with apparently successful transmission in four cases.—D. LUKE.

BARRON, N. S., & HOWELL, D. (1949.) **Oedema disease of swine.** [Correspondence.]—*Vet. Rec.* 61. 790. 1029

B. & H. support the view that an infective agent is responsible for the condition. The majority of outbreaks occur within a week of the arrival of the pigs on the premises and further outbreaks have been seen among home reared pigs a week later. The disease has been encountered under widely different methods of husbandry and feeding.—D. LUKE.

REK, L. (1949.) Vliv některých živočišných bílkovin na osutinu vepřů. [The influence of some animal proteins on dermatitis in pigs.]—*Čas. československ. Vet.* 4. 189-196. 1030

R. suggests that a skin rash in pigs may be caused by a latent virus which is activated by sudden changes of circumstances, such as weaning, castration, undernourishment, or unsatisfactory hygienic conditions. He claims that a diet rich in proteins was beneficial.—E. G.

CHARLES, G. (1947.) **Unusual effect of grass seed in sheep.**—*Yearb. Inst. Insp. Stk N.S.W.* 1947. pp. 59-60. 1031

Severe lesions of the lips and faces of ewes and lambs were caused by the penetration of barley grass seed, followed by fly-strike. Removal of the seed from the lesions of affected sheep, followed by swabbing with 5% copper sulphate led to complete recovery.—D. F. STEWART.

BODDIE, G. F. (1949.) **The differential diagnosis of canine paraplegia: A clinical and radiological study.**—*Vet. Rec.* 61. 511-515. 1032

Clinically, cases of paraplegia in the dog may be conveniently arranged in three groups: those that are a sequel to distemper or distemper-like diseases, those that follow trauma and accidents, and those in which there is no history of illness or accident. The mode of onset, the presence of pain, and the degree of rigidity of the spine are useful differential features in some cases. The following conditions causing paraplegia, in which radiographic examination gives positive signs, are discussed: (1) Results of trauma—dislocation; impaction of vertebrae as a result of car accident; fractures (five cases of fracture of the epistropheus in greyhounds are mentioned, with pain, and fixation of the neck, but no paraplegia). (2) Changes in vertebral bodies: four cases have been encountered—two, of tuberculous origin, a third associated with fracture of a transverse process, and a fourth of unknown nature. (3) Anchylosing spondylitis: this was mainly seen in large dogs, and the onset of paraplegia was usually gradual. (4) Intraspinal tumours: four cases were seen,

with very sudden onset of symptoms. Intrathecal lipiodol revealed compression of the cord in one case.

B. has not seen ossification of the intervertebral disks, nor prolapse of a disk.

—E. COTCHIN.

GUILHON, J., DEGRACIANSKY, P., & PARAF, A. (1948.) Les granulomes à éosinophiles de la peau. [Eosinophile granuloma of the skin.]—*Pr. med.* 56. 448-449. 1033

The term "eosinophilic granuloma" comprises several disparate conditions, the only common feature of which is the presence of numerous, infiltrating, eosinophile, polymorphonuclear leucocytes. In man the authors recognize three separate entities: periorificial granuloma, certain types of reticulosis and certain sarcomas. One entity is recognized in the cat: the "syphilitic disease" of Henry and Bory—an eosinophile-infiltrated granuloma consequent on the licking of eczematous sores. The clinical manifestations of this disease are described and discussed in detail. There is a marked eosinophilia of the blood paralleled by eosinophilic hyperplasia of the haemopoietic bone marrow. These last features are found constantly in eczematous cats, even when granulomata are absent.—L. M. MARKSON.

BRUGER, M., & LOWENSTEIN, B. E. (1948.) **Experimental atherosclerosis. X. The effect of desoxycorticosterone acetate on the cholesterol content of the blood, the aorta and the liver of the rabbit.**—*Arch. Path.* 46. 536-541. [Authors' conclusions slightly modified.] 1034

Hypercholesteremia and atherosclerosis develop readily in cholesterol-fed rabbits. The inter-relationship between the adrenal cortex and cholesterol metabolism has been studied.

Parenteral administration of desoxycorticosterone acetate has little or no effect on whole blood cholesterol levels in rabbits fed cholesterol.

Desoxycorticosterone acetate which is only 1 of 28 compounds isolated from the adrenal cortex does not prevent the development of atherosclerosis of the aorta or the deposition of cholesterol in the liver of the rabbit under the conditions of the experiment.

KOPELOFF, L. M., & KOPELOFF, N. (1947.) **Neurologic manifestations in laboratory animals produced by organ (adjuvant) emulsions.**—*J. Immunol.* 57. 229-237. [Part of authors' summary copied almost *verbatim*.] 1035

Neurologic disturbances, characterized chiefly by paralysis of the hind limbs, have been induced in normal guinea pigs by single subcutaneous injections of emulsions of homologous and heterologous brain and heterologous kidney, containing Freund's (1942) adjuvants, as well as

similar preparations of alcoholic extracts of brain. Testicle emulsions were without effect in normal guinea pigs, but induced hind leg paralysis in 2 guinea pigs which had previously received injections of various organ suspensions.

It was also possible to produce this phenomenon in rabbits by repeated injections of adjuvant-emulsions of both rat brain and alcoholic extract of sheep brain in combination with egg-white.

DINTER, Z. (1946.) Über eine der Rollkrankheit ähnliche Infektion der weissen Maus. [**A disease similar to rolling disease in white mice.**]—*Berl. Münch. tierärztl. Wschr.* No. 6. pp. 68-69. 1036

A description of a disease affecting white mice and resembling (clinically, if not aetiologically) rolling disease.

Investigation of the causative agent remained incomplete, owing to the war, the only findings being that it is filtrable and polyorganotropic.

—G. P. MARSHALL.

RASCH, K., & MATZKE, M. (1949.) Enzootischer Herztod und regressive Leberverfettung der Hühner. [**Toxic heart degeneration ("round heart" disease) and fatty degeneration of the liver in fowls.**]—*Dtsch. tierärztl. Wschr.* 56. 357-359. 1037

In April-December, 1948, 27 of 53 cases of "round heart disease" occurred in August and September in Leghorn fowls, 41 of which were under one year of age. Six cases, otherwise typical of the disease, had instead of the characteristic heart lesion a fatty degeneration of the liver, and two others had both the usual cardiac lesion and the liver degeneration. While the theory of the toxic origin of the condition was thus supported, there was some indication of a predisposition to it in the Leghorn breed.—E. COTCHIN.

FRISCHBLIER & RINFLEISCH-SEYFARTH, M. (1948.) Die Nierenschädigungen des Hausgeflügels unter dem Gesichtspunkt der allgemeinen Nephritisforschung. [**Kidney diseases of poultry.**]—*Dtsch. tierärztl. Wschr.* 55. 161-165. 1038

After a description of the anatomy of the avian kidneys the authors describe the commonest kidney diseases in fowls. In young fowls a degenerative nephrosis is not uncommon and in full grown birds it occurs also along with glomerulo- and interstitial-nephritis as a cause of death. Ingestion of sodium chloride appears to predispose to or initiate nephrosis.—J. E.

JUDGE, D. J., RICE, E. C., & DAVIS, E. W. (1949.) Pulmonary gangrene of a child following aspiration of timothy grass.—*J. Pediat.* 34. 87. [Abst. in *Amer. Rev. Tuberc.* 60. No. 4. p. 57

of absts., slightly modified. Signed: W. H. OATWAY, Jr.] 1039

Aspiration of timothy grass into the tracheo-bronchial tree is common. The grass is progressively propelled into the lung periphery; severe and prolonged complications may follow, including lung abscess, suppuration and bronchiectasis. A case is presented in which, for the first time, gangrene is reported as a sequel. An infant of 21 months swallowed some timothy hay, developed pulmonary suppuration, failed to respond to bronchoscopy and surgical drainage, and died 37 days after the onset. Autopsy demonstrated a diffuse purulent bronchitis, lung abscess of the right lower and middle lobes, and gangrene of the upper lobe.

DOAN, C. A. (1949.) **Hypersplenism.**—*Bull. N.Y. Acad. Med.* 25. 625-649. [Author's summary copied *verbatim*.] 1040

The spleen has inherited a unique anatomical structure, in which the relationship between smooth muscle capsule, pulp, and large fenestrated sinuses makes for an ideal physiological reservoir for blood cell storage. The selective concentration of the stored elements of the blood, through the mechanism of deplasmated stasis—which in turn probably hastens unfavorable qualitative alterations in these cells—when combined with an abundance of naturally occurring R-E cells, provide a basis for an apparent inherent homeostatic cellular instability in acquired, and an inherited hyper-instability in primary hypersplenism. A sub-acute, low-grade cellular disequilibrium may lead in one patient to chronic invalidism, in another the same mechanism may result in a vicious cycle, in which an acutely developing negative cellular balance will threaten survival. The resulting anemia, leukopenia or thrombocytopenia, which may be highly selective and specific, or in any combination and degree, underlie and govern the wide range of symptoms and signs which characterize these syndromes. Therefore, when the bone marrow is eliminated as a contributing factor, and a basic splenic mechanism is established, prompt removal of the spleen and all accessory splenic tissue provides the only assurance of a complete and lasting hematologic and clinical remission.

O'BRIEN, J. P. (1948.) **Tropical anhidrotic asthenia: its definition and relationship to other heat disorders.**—*Arch. intern. Med.* June. 81. 799-831. [Abst. in *Trop. Dis. Bull.* 46. 780-781. (1949), copied *verbatim*. Signed: G. P. CROWDEN.] 1041

Until recent times little has been known of the ill-effects [in human beings—Ed. V.B.] which may be due to increasing impairment of

sweat function arising during residence in tropical countries where miliaria rubra (prickly heat) is of common occurrence.

The disorder called tropical anhidrotic asthenia is characterized by exhaustion, headache and dyspnoea associated with failure of sweating over a large area of the body when working in the heat. Sweating may be profuse on the face but markedly diminished over those covered areas of the body where prickly heat is most commonly found. The condition is held to be due to the occlusion of the sweat ducts and the extravasation of sweat into the tissues. The paper contains a very full discussion of symptoms and signs. Details of 88 severe cases are compared with those given by other workers, in particular the cases of heat exhaustion type 2 described by LADELL *et al.* in Iraq [see *Trop. Dis. Bull.* (1945.) 42. 148].

The question of terminology for this disability due to post-miliarial obstructive impairment of sweat function, as distinct from the classic heat disorders, is considered in some detail. It is thought that the development of this disorder

See also absts. 916-918 (strawberry foot rot); 1106 (water-borne diseases).

constitutes a specific form of tropical deterioration which limits the duration of an individual's acclimatization to residence in the tropics.

GRANADOS, H., GLAVIND, J., & DAM, H. (1949.)

Observations on experimental dental caries.

V. The effect of certain quinones with, and without vitamin K activity.—*Acta path. microbiol. scand.* 26. 597-602. [Authors' summary slightly amended.] 1042

The effect of 8 quinones (the tetrasodium salt of 2-methyl-1,4-naphthohydroquinone-diphosphoric acid ester; the dicalcium salt of 2-methyl-1,4-naphthohydroquinone-diphosphoric acid ester; and 2-methyl-1,4-naphthoquinone) with and 8 without vitamin K activity (2,3-dichloro-1,4-naphthoquinone, hydroquinone, and benzoquinone) on dental caries activity has been studied in hamsters, with a litter-mate control group. Under the conditions of the experiments none of the groups which received quinones exhibited any significant decrease of caries activity as compared with the control group. Some implications of these studies are discussed.

POISONS AND POISONING

KIDDER, R. W. (1949.) Symptoms of induced copper toxicity in a steer.—*J. Anim. Sci.* 8. 628-624. [Only abst. given, abst. from abst.] 1043

In studying the copper requirements of cattle and determining the maximum tolerance as well as the minimum requirement some cattle have been sacrificed by overdoses of copper sulfate as well as by withholding copper from the ration. One 500 pound steer developed chronic copper poisoning and died after 122 days on a daily drench containing 5 grams of copper sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$). The symptoms, as illustrated by kodasides, follow very closely those described for sheep. The trial began in the autumn and continued for 102 days when the steer developed inappetence and diarrhoea. Following a partial recovery period of 26 days, the drenches were continued for 20 days before prostration and death about 10 hours later. General details are given of the lesions.

BEIJERS, J. A. (1948.) Acute arsenicumvergiftung bij runderen. [Acute arsenic poisoning in cattle.]—*Tijdschr. Diergeneesk.* 73. 915-921. 1044

An account of arsenic poisoning.—G. P. M. ROEMMELE, O. (1948.) Bleivergiftungen bei Rotwild im Unterharz. [Lead poisoning in red deer in the Harz mountains.]—*Dtsch. tierärztl. Wschr.* 55. 38-36. 1045

Red deer in the Harz mountains developed symptoms of muscular incoordination found to result from lead poisoning, the source being traced to hay cut from meadows which were exposed to contamination by smoke from lead mines and by dust from the slag heaps. Farmers using the same hay reported cases of poisoning in their domestic animals. No further cases occurred when hay was obtained from uncontaminated sources.—G. P. M. BOND, E., & KUBIN, R. (1949.) Lead poisoning in dogs.—*Vet. Med.* 44. 118-123. 1046

Diagnosis was made from clinical observation and laboratory examination of nine cases. A successful treatment is described based on the similarity of the metabolism of lead and calcium, the lead being deposited in the bones where it is harmless, if it remains there. Details are given of the treatment.—G. D. SHEARER.

MÓCSY, J. (1949.) Sertések konyhasómergezése. [Sodium chloride poisoning in pigs.]—*Magyar Allatorvosok Lapja.* 4. 66-67. [Abst. from abst. in *Nutr. Abstr. Rev.* 19. 494. (1949), signed: I. FINÁLY.] 1047

A herd of 300 pigs with bodyweights about 15 to 20 kg., was given 2.5 per cent. NaCl mixed in the feed. After some days about 25 per cent. of the pigs showed severe disturbances. Little water had been given at the time.

MAJUMDAR, B. N., & RAY, S. N. (1947.) Determination of fluorine in biological materials and

its application in fluorine intoxication studies in cattle in India.—*Indian J. med. Res.* 35. 923–384. 1048

By using a modification of the method of Willard and Winter for the estimation of fluorine, the authors claim that fluorine was determined in amounts as low as 25 or 35 μg . with an error not exceeding $\pm 5\%$, in blood, bone and other tissues of normal and fluorosis-affected cattle and also in a number of feeding stuffs. In areas where fluorosis occurs high concentrations of F were observed in the water and soil samples, but not in the feeding stuffs. Affected animals, had high accumulation of F in their tissues. P.M. estimation of this element in the pelvic bone and molars may be used as a routine test for fluorosis cases and localities.—B. C. RAY SARKAR.

VISWANATHAN, G. R. (1944.) Fluorosis of cattle in the Madras Presidency.—*Indian J. vet. Sci.* 14. 289–242. 1049

A note on the lesions of fluorine poisoning in cattle in the Madras Presidency. Phosphorus deficiency was considered also to exist in the affected animals.—S. N. RAY.

VISWANATHAN, G. R. (1947.) Iizuka's test for fluorosis in bovines.—*Indian vet. J.* 24. 166–167. 1050

A short note on use of the needle puncture method of judging the extent to which bone is affected.—S. N. RAY.

CAMPBELL, R. M., & KOSTERLITZ, H. W. (1948.) The effects of short-term changes in dietary protein on the response of the liver to carbon tetrachloride injury.—*Brit. J. exp. Path.* 29. 149–159. 1051

Male hooded rats were fed a basal nitrogen-free diet of 2% agar, 3% salts, 25% sucrose, 60% potato starch, and 10% lard, with a full vitamin supplement, or a diet containing 18 or 54% casein for three days before the administration of 0.2 ml. per 100 g. body weight carbon tetrachloride by a single subcutaneous injection. Animals in each group were killed $4\frac{1}{2}$ to 5, 24, 48 and 72 hours after injection. Protein + phospholipoid and nucleic acid (P.P.N.)—a measure of labile cytoplasm—glycogen, neutral lipid and water were estimated in the liver.

The immediate result of injecting carbon tetrachloride was to produce a fall in liver glycogen. Liver cytoplasm, however, increased on all diets including the protein-free one; the increase was at its maximum 2–3 days after injection. As histological section revealed the typical central necrosis associated with carbon tetrachloride it is concluded that an increase in liver cytoplasm occurred in the cells unaffected and the number of new cells formed exceeded the number of

damaged cells in which cytoplasm was removed or decreased.

An increase in water accompanied the rise in P.P.N. which was sometimes so pronounced that water oozed freely from the cut surface of the liver. Hydropic and necrotic changes were most marked in rats fed 18% casein, less in those given 54% casein, and almost absent in those fed a protein-free diet. The amount of fat present in the liver increased with the casein of the diet.

On the basis of these experiments the authors consider that a diet rich in carbohydrate, low in fat and protein gives the greatest protection against liver injury from carbon tetrachloride.—A. T. P.

POLLOCK, G. H. (1949.) Species specificity of agene toxicity.—*J. Appl. Physiol.* 1. 802–806. [Abst. in *Nutr. Abstr. Rev.* 19. 417. (1949), copied *verbatim*. Signed: E. D. BAIRD.] 1052

Unbleached commercial flour was experimentally treated with agene until the level was 150 to 300 g. NCl_3 per 100 lb. This flour was baked and the products were given to dogs, cats, monkeys and human subjects. All diets were nutritionally adequate. The human subjects, 2 males and 1 female, were epileptics who had seizures at long intervals only, and who were normally intelligent and free from other diseases. Anticonvulsant medication was discontinued. At the end of a month on a control diet with unbleached wheat products the patients were given the experimental diet until they had eaten one-half their initial bodyweight in agenised wheat products, during which time they were repeatedly studied with or without inhalation of 30 per cent. CO_2 and 70 per cent. O_2 .

Dogs given the toxic material developed severe signs within 18 hr. With further administration death ensued. Cats showed slight electroencephalographic (EEG) abnormality and monkeys a variable response. The human subjects, after receiving agenised wheat products in quantities 10 times the lethal amount for dogs for long periods of time, did not develop any EEG abnormality, nor was there any alteration in urinary N or albumin, or blood or cerebrospinal fluid constituents. No electrocardiographic abnormality or increase in seizure activity occurred. The ingestion of agenised flour thus caused no gross psychological, psychiatric, nutritional or neurological defect in the human subject.

HEATHCOTE, J. G. (1949.) Inhibition by methionine of the toxicity of crystals from agenised zein. Observations on *Leuconostoc mesenteroides*.—*Lancet*. 257. 1130–1131. [Author's summary copied *verbatim*.] 1053

The addition of methionine arrests the toxic effect on *Leuconostoc mesenteroides* P 60 of the

crystals isolated from agerised zein. This finding is in keeping with the view that it is the methionine portion of the protein molecule which is essential for the production of the toxic substance.

YEOMAN, F. T. (1946.) **Suspected nardoo poisoning (*Marsilea drummondii*). Peculiar disease in horses—Moree P.P. district.—Yearb. Inst. Insp. Stk N.S.W. 1946. pp. 57–59. 1054**

Illness followed by death and considered to result from the ingestion of nardoo (*Marsilea drummondii*) occurred in the Moree district in horses grazing on water-course country which is periodically flooded. The main symptoms were extreme excitement and incoordination of movement. In advanced cases blindness and deafness were present. P.M. examination did not reveal any abnormality, but the central nervous system was not examined.—D. F. STEWART.

JONES, T. R. (1946.) **An unusual type of mortality in cattle. (Attributed to Rock Fern).—Yearb. Inst. Insp. Stk N.S.W. 1946. pp. 55–56. 1055**

Deaths in cattle attributed to poisoning with rock fern (*Cheilanthes tenuifolia*) are described. Of 68 head 18 died. Symptoms became manifest only after the cattle had been driven some 20 miles. The affected animals were ill for several days, then developed a black scour and died with little struggling. P.M. findings are described, the outstanding features being petechial haemorrhages of the serous surfaces and extensive haemorrhagic ulceration of the alimentary tract.—D. F. S.

BRAY, K. S. F. (1947.) **A note on the apparent toxicity of *Craspedia chrysantha*—"yellow top" or "Billy button".—Yearb. Inst. Insp. Stk N.S.W. 1947. pp. 69–72. 1056**

Nine out of 646 cattle were considered to have died as a result of the ingestion of *Craspedia chrysantha*. The symptoms were inappetence,

colic, diuresis and diarrhoea. P.M. examination revealed slight gastro-enteritis.—D. F. STEWART.

EVANS, W. C., & EVANS, E. T. R. (1949.) **Relation of a clover juice factor causing paralysis of smooth muscle to bloat in ruminants.—Nature, Lond. 163. 373–375. 1057**

It has been reported that the juices from certain legumes cause relaxation and paralysis of the isolated rabbit intestine and may be responsible for the atony of the rumen seen in bloat [see FERGUSON, W. S. V. B. 19. 26]. The authors observed that crude juice from a white clover has the same effect on the isolated rabbit intestine as HCN and 1 litre of this juice introduced directly into the rumen of a sheep caused paralysis of ruminal movements and death, the symptoms and P.M. findings being consistent with HCN poisoning. It is concluded that since cyanogenic glucosides are known to be present in certain legumes, these findings are of considerable significance in elucidating the aetiology of bloat.—J. A. NICHOLSON.

LEWIS, H. B., & SCHULERT, A. R. (1949.) **Experimental lathyrism in the white rat and mouse.—Proc. Soc. exp. Biol. N.Y. 71. 440–441. [Abst. from authors' summary.] 1058**

Young white mice of 12 to 15 g. body weight fed diets containing 50% *Lathyrus odoratus* meal remained healthy up to the 17th week, although young white rats given a similar diet developed lathyrism in 3–6 weeks. Diets containing *L. latifolius* meal (50%) were toxic for both rats and mice, death following in 3–8 days (rats) and 5–12 days (mice). The extraction of seed of *L. latifolius* meal with 30% ethanol removed the toxic principle. Mice fed the extracted meal survived and appeared normal over a period of 18 days. Mice fed *L. sylvestris* seed died with symptoms of acute poisoning in 4–7 days.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see the appropriate disease)

KRUSEN, F. H., HERRICK, J. F., LEDEN, U., & WAKIM, K. G. (1947.) **Microkymatotherapy: preliminary report of experimental studies of the heating effect of microwaves ("radar") in living tissues.—Proc. Mayo Clin. 22. 209–224. 1059**

Electromagnetic waves at a frequency of 2,450 megacycles per sec. generated by means of a magnetron oscillator give a higher therapeutic efficiency than at the frequency of 27 megacycles per sec. commonly used for short-wave diathermy. The absorption in water at 100° F. is about 7,000 times greater.

Power of 65 watts at a frequency of 3,000 megacycles per sec. was applied for 20 min. at a

distance of 5 cm. to an area of about 50 sq. cm. on the thigh muscles of dogs. Before and after irradiation thermocouples were placed on the skin and into the subcutaneous tissue and muscle up to a depth of 3 cm. Temperatures were reproducible to within a few tenths of a degree.

Rise of temperature was confined to the irradiated region and averaged 3–5° C. to a depth of 2 cm., returning to normal about 30 min. later. Muscle at a deeper level was heated somewhat less than superficial layers of muscle. Temperature rise of the thigh muscle was accompanied by a transient increase in the blood flow of the femoral vein. Studies of the therapeutic use of microwaves have yet to be made.—C. J. BRADISH.

SOLTYS, M. A. (1949.) Application of radioactive elements to biological science.—*Vet. Rec.* 61. 211-212. 1060

A brief general review of the tracer method in biological research.—C. J. BRADISH.

DOLL, E. R., & WALLACE, M. E. (1948.) Water-in-oil emulsions for delaying absorption of penicillin in horses.—*Amer. J. vet. Res.* 9. 254-258. 1061

Normal horses, including unweaned foals, weanlings, yearlings and adult mares several years old, were injected, intramuscularly. Penicillin G was dissolved in saline before emulsifying with the oil vehicles and the products used were as follows:—3 ml. of a vegetable oil containing oxycholesterol mixed with 100,000 units of penicillin in 1 ml. saline; a peanut oil mixture containing 11 parts cholesterol, 20 parts peanut oil and 2% beeswax used (a) 3 ml. oil diluent with 100,000 units in 1 ml. saline (b) 1.5 ml. oil diluent with 100,000 units in 1 ml. saline, (c) 3 ml. oil diluent with 200,000 units in 1 ml. saline. For comparative purposes a dose of 500 units per lb. body weight was used for all animals and for each combination of vehicle and penicillin solution. Penicillin concentration was determined on jugular vein samples obtained at intervals of one or two hours.

When the mixture of 3 ml. vegetable oil containing oxycholesterol and 1 ml. of saline containing 100,000 units penicillin was used, detectable blood levels were obtained 1-2 hours longer than with penicillin in saline. With a mixture of 11 parts cholesterol, 20 parts peanut oil and 2% beeswax combined with penicillin in the proportion of (a), (b) or (c) was used, only considerable tissue irritation, or poor efficiency in delaying penicillin absorption, was realized. The authors conclude that penicillin in oil and wax (Romansky formula) is more suitable for field use in large animal practice.—MALCOLM WOODBINE.

JONES, L. M., SMITH, H. A., & ROEPKE, M. H. (1949.) The effects of large doses of various sulfonamides injected intravenously in dairy cattle.—*Amer. J. vet. Res.* 10. 318-326. [Authors' summary and conclusions copied verbatim.] 1062

Sulfamethazine sodium produced a transient "drug shock" in 1 cow after 48 Gm. had been injected intravenously. No shock was noted on subsequent injections. Sulfaquinoxaline sodium produced severe drug shock in 3 cows after 60 Gm. were injected. One cow did not recover. A later injection of 48 Gm. again caused drug shock. After the fourth injection of sulfapyridine sodium, 1 cow died, showing failure of the normal blood-clotting mechanism and a progressive

decrease in red blood cells and hemoglobin. No significant variations in body temperature were noted following the administration of the drugs. Only about 76 per cent of the total amount of sulfaquinoxaline present in a sample of ox blood is accounted for by the standard method of Bratton and Marshall for sulfonamide analysis. Sulfaquinoxaline temporarily prolonged the blood-clotting time by two times or more of normal.

Blood-urea nitrogen analyses did not reveal levels widely divergent from the normal range, during and after the administration of sulfonamides intravenously. After 60-Gm. doses, the drugs disappeared from the blood stream in the following order: sulfathiazole, sulfaquinoxaline, sulfadiazine, sulfamerazine, sulfapyridine, and sulfamethazine. After 90-Gm. doses, the order of disappearance was the same except that sulfapyridine lasted as long as did sulfamethazine. After injecting 60-Gm. doses of the above sulfonamides, intravenously, concentrations of more than 5 mg. per 100 cc. of blood were maintained for five to twenty-nine hours, respectively, and concentrations of more than 2 mg. for fifteen to forty-six hours, respectively.

Precipitated sulfonamide crystals were found in the kidneys of 2 of the 3 cows that received sulfaquinoxaline. Microscopically, kidneys from all the cows showed acute passive congestion of the medullary venules; one third showed albuminous casts; and one half showed partial loss of the cytoplasm of the tubular epithelium. Microscopically, all the liver sections showed cloudy swelling and albuminous degeneration, sometimes with an advancing necrosis of hepatic epithelium and sometimes accompanied by intracellular fat.

Death of cow 13 appeared due to some toxic effect of sulfapyridine upon the normal blood-clotting mechanism and perhaps upon the fragility of the capillaries. Death of cow 89, which received 60 Gm. of sulfaquinoxaline, probably resulted from the extensive myelin degeneration of the tissues of the central nervous system, as shown by the first lumbar section of the spinal cord. Certainly, the paralysis of the legs could be explained by the myelin degeneration observed in the sciatic and median nerves.

HAFKESBRING, R., & WERTENBERGER, G. E. (1947.) The effect of sulfonamide administration on cardiac function in the dog.—*Amer. Heart J.* 33. 84-101. [Authors' summary copied verbatim.] 1063

The effect of various sulfonamide drugs on the electrocardiogram was studied in thirty-nine dogs.

Sulfonamide administration had no effect upon the cardiac muscle and conducting system which could be demonstrated by the electro-

cardiogram in thirty-two dogs (82 per cent of the number studied), even though eleven of these dogs showed conduction defects before treatment. Electrocardiographic abnormalities consisting of slight S-T segment deviation and change in direction of T wave occurred in seven dogs during medication and indicated some myocardial involvement. These changes were transient and disappeared after drug administration was stopped in all except three cases. The possibility that these electrocardiographic changes were the result of morphologic changes in cardiac muscle caused by sulfonamide sensitization is discussed.

WAKSMAN, S. A., FRANKEL, J., & GRAESSLE, O. (1949.) *The in vivo activity of neomycin.*—*J. Bact.* 58. 229-237. [Authors' summary copied *verbatim.*] 1064

Crude preparations of neomycin in concentrations of 2,000 to 5,000 units when injected subcutaneously into mice weighing 15 to 20 g were well tolerated by experimental animals. These concentrations are at least 20 to 50 times the protective concentration of this antibiotic. Neomycin did not exert any serious toxic effects when instilled into the rabbit's eye, a toxicity test characteristic for streptothricin. Neomycin was more effective than streptomycin in suppressing infection of mice with *Staphylococcus aureus*. It was as effective upon the streptomycin-resistant strains of this organism as upon the sensitive strains. Neomycin was more effective than streptomycin by oral administration in protecting mice infected intraperitoneally with *S. aureus*. Neomycin was more effective than streptomycin in suppressing infections caused in mice and in chick embryos by *Salmonella schottmülleri*. It was as effective upon streptomycin-resistant as upon streptomycin-sensitive strains. Neomycin was far more effective than streptomycin in suppressing infection of chick embryos with *Salmonella pullorum*. Neomycin was highly bactericidal upon *S. pullorum* as measured by injecting embryos with mixtures of 24-hour-old cultures of the organism and neomycin. Neomycin proved to be highly effective, far more than streptomycin, upon *Eberthella typhosa* in mice.

WEEKS, R. E., & GUNNAR, R. M. (1949.) *Effect of tripeleannamine hydrochloride on acute inflammation.*—*Arch. Path.* 48. 178-182. [Authors' summary copied *verbatim.*] 1065

In these experiments tripeleannamine (pyribenzamine [N,N-dimethyl-N'-benzyl-N'-(α -pyridyl) ethylenediamine]) reduced the erythema and the increase in permeability of capillaries that follow the intradermal injection of concentrations of histamine comparable to those found in inflammatory exudates. The drug reduced the erythema

that followed burns and injections of turpentine under similar experimental conditions, but failed to alter the increase of capillary permeability that follows the application of these irritants. No alteration of the microscopic picture of acute inflammation was noted after administration of the drug.

COLLET, P., & PÉRES, G. (1947.) *Contribution à l'étude expérimentale de l'acétylcholine chez le cheval. [The action of acetylcholine on horses.]*—*Bull. Soc. Sci. vet. Lyon.* 49. 58-65. 1066

Acetyl choline at a dosage rate of 80 mg. was injected intravenously into five horses weighing from 250-350 kg. and into one weighing 197 kg. at a dose of 200 mg.; effects were produced similar to those obtained with other mammals, that is, a slower followed by an accelerated heart beat and a lowering of arterial pressure. At higher dosages the period of accelerated heart rate was accompanied by increased arterial pressure. An attempt to use acetylcholine therapeutically in cases of colic was not successful as doses sufficient to produce any effect were close to the toxic level.—R. MARSHALL.

ASTWOOD, E. B., GREER, M. A., & ETTLINGER, M. G. (1949.) *l-5-Vinyl-2-thiooxazolidone, an antithyroid compound from yellow turnip and from brassica seeds.*—*J. biol. Chem.* 181. 121-130. [Authors' summary copied *verbatim.*] 1067

An antithyroid compound, equal in potency to thiouracil in man, has been isolated from the root and seed of turnip and from the seed of cabbage, kale and rape. This hitherto unknown substance was proved to be l-5-vinyl-2-thiooxazolidone.

FERGUSON, J. K. W., & SELLERS, E. A. (1949.) *The antioitrogenic action of elemental iodine.*—*Endocrinology.* 45. 375-377. [Authors' summary copied *verbatim.*] 1068

Elemental iodine by injection did not prevent the enlargement of the thyroid gland produced in white rats by thiouracil given orally. A limited antioitrogenic action resulted from elemental iodine by injection but the magnitude was no greater than that often observed with iodides given orally. Elemental iodine by injection lessened the rate of decrease of metabolic rate under treatment with thiouracil, while iodides had no such action. This observation is consistent with the hypothesis that some thyroxin-like material can be produced from elemental iodine in extra-thyroid tissues.

PAPE, F. (1949.) *Ein Beitrag zur Durchführung der Weckbehandlung bei Chloralhydrat- und kombinierten Chloralhydrat-Aether-Chloroform-Narkosen des Pferdes.* [Re-

duction of post-narcosis period after chloral hydrate and combined chloral hydrate ether and chloroform anaesthesia of the horse.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 17th, 819–820. 1069

“Panalept-Asid”, a solution containing 0.2 g. benzedrine sulphate, 0.004 g. strychnine nitrate and 0.001 g. r-adrenalin with stabilizing substances, was used to reduce the duration of post-operative narcosis in horses anaesthetized with chloral hydrate or chloral hydrate, chloroform, ether mixtures.

After a dose of 10 ml. injected slowly intravenously at the end of an operation the horses were wide awake within 3–5 min. so that they could be led away from the operation table. There were no relapses.

To test whether larger doses of “panalept” would still further reduce the duration of post-operative narcosis, 12–15 ml. were injected intravenously into horses previously anaesthetized by intravenous injections of from 55–60 g. chloral hydrate. The horses still required 3–5 min., however, to regain complete activity.—A. L. W.

DAVIES, G. E. (1949.) Quaternary ammonium compounds. A new technique for the study of their bactericidal action and the results obtained with cetavlon (cetyltrimethylammonium bromide).—*J. Hyg., Camb.* 47. 271–277. [Author's summary copied *verbatim*.] 1070

Some sources of error in the testing of quaternary ammonium compounds for bactericidal activity have been investigated. These resolve themselves into (a) errors caused by bacteriostasis and (b) errors caused by the clumping of bacteria. A suitable technique, free from these errors, is described. Cetavlon in 0.1% solution is a powerful bactericide even in the presence of moderate amounts of organic matter. One per cent Cetavlon will not kill spores at room temperature even when contact is maintained for several days. Bacteria surviving the action of quaternary ammonium compounds retain their virulence.

MALLMANN, W. L. (1948.) Practical aspects of disinfection.—*Soap & Sanit. Chem.* 24. 141, 148, 145, 165 & 167. 1071

The evaluation of the efficiency of a disinfectant in the laboratory has often little bearing

on its practical application. The most important property of a disinfectant, accepting the fact that the compound has the property of killing bacteria as demonstrated by the phenol coefficient, is penetration. This characteristic is largely overlooked in most of the laboratory techniques of evaluation; it is very important, however, particularly when attempts are made to apply disinfectants to substrates where bacteria are intimately intermingled with inorganic and organic soil. At present there are no good routine laboratory procedures for assessing penetration. Efficiency is impaired by the presence of organic matter, *e.g.* blood serum, neutralizing agents, antagonistic ions and particularly by incompetence of operators.—W. MOORE.

SCHUBERT, H. (1949.) Die gemeinsamen Grundlagen von Desinfektion und Chemotherapie. [Elements of disinfection and chemotherapy.]—*Zbl. Bakt. (I. Orig.)* 153. 16–27. [English, French & Russian summaries, abstr. from English summary.] 1072

The mathematical analysis of the curves of bactericidal action as well as the results of other methods of cellular research show that in a cell there must be distinguished a genetic system and a metabolic system. Whereas disinfection mainly affects the genetic system, chemotherapy mainly affects the metabolic system of the parasite. A number of conclusions with regard to bacterial and virus diseases can be drawn.

ANDERSON, R. F. (1948.) Relation of droplet size to toxicity in residual-type DDT-oil sprays.—*J. econ. Ent.* 41. 974–976. [Author's summary copied *verbatim*.] 1073

Laboratory tests were conducted to determine the relation of droplet size to toxicity in residual-type DDT oil sprays. Uniform-size droplets of DDT solution were made by momentarily touching the tip of a fine-pointed pipette to the inner bottom surface of petri-dish test chambers. Droplets of different sizes were made by varying the size of the pipette openings. Tests against the pomace fly, *Drosophila melanogaster* Meig., showed that toxicity varied inversely with droplet size. Better dispersion of the DDT, obtained by using more dilute solutions and consequently a larger number of droplets, also increased the effectiveness of a given amount of DDT.

See also absts. 832–833 (mastitis); 877 (bovine foot rot); 890 (dourine); 891 (trypanocide); 898 (piroplasmosis); 968 and 973 (insecticides); 971 (D.D.T.); 976 (gammexane, gamatox); 978 (sarcoptic mange in dogs); 985 (lungworms); 986 (verminous bronchitis); 1026 (udder injuries); 1027 (calf diarrhoea); 1117 (laminitis and metritis); 1176 (book, pharmacology); 1177 (book, penicillin).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

CUPPS, P. T., & HOWELL, C. E. (1949.) Motility patterns of the cecum of the horse.—*J. Anim. Sci.* 8. 689. [Only abstr. given, copied *verbatim*.] 1074

A fistula was established by surgical means in the cecum of a Percheron filly fourteen months of age. Kymographic records of the motility of the organ were taken. Peristaltic waves travelling

from the base to the apex with occasional waves travelling in the reverse direction were found. Local contractions were interspersed between the peristaltic waves. Large tonus changes occurred and seemed to be related with movement of ingesta through the digestive tract. The patterns of activity could be modified by changing the kind of feed and feeding method. Drinking large amounts of water modified the pattern of motility extensively. Feed first appeared at the fistula in about one and one-half hours after eating; reached a maximum at three to four hours; then declined until very little was present after six hours. Leakage of ingesta from the fistula was greater when the roughage was alfalfa than when it was oat hay.

SPRAGUE, J. M. (1946.) The distributions of axons from the motor cell groups in the spinal cord of the fetal sheep.—*J. comp. Neurol.* 85. 127-139. 1075

The formation and position of motor cell groups and the structure of the ventral roots and the primary rami in the spinal cord of foetal sheep at various stages were described.—E. G.

DAWSON, W. M., & REEVES, R. L. (1946.) Varying susceptibility in pigs to alarm.—*J. comp. Psychol.* 39. 297-305. [Abst. in *Anim. Breed. Abstr.* 17. 147. (1949), slightly modified. Signed: A. P. G.] 1076

There were wide individual variations between the 42 sows tested in the time they required to return to feed after being scared away by an electrical sparking device. A highly significant correlation of 0.809 was found between the data obtained with litter mates, indicating that susceptibility to alarm might be inherited. No definite relation could be shown between the time required for a sow to return to feed and (a) her average daily gain, (b) her overlying of her young, or (c) the weight of her piglings at 8 weeks of age.

HUZII, K. (1939.) Experimentelle Studien über die Physiologie der Milchsekretion. [Experimental studies on the physiology of milk secretion.]—*Jap. J. med. Sci.* 1. Sect. 11. 19-66. [In German.] [Abst. in *Dairy Sci. Abstr.* 10. 38-39. (1948), copied *verbatim*. Signed: A. T. C.] 1077

Huzii reviews the literature on lactational physiology and outlines numerous experiments of his own.

The histology of the mammary gland in the non-pregnant and pregnant rabbit is described in some detail. In rabbits made pseudo-pregnant by the injection of chorionic gonadotrophin both duct and alveolar growth approximating in extent to that present at the 10th day of pregnancy occurred. Regressive changes set in about the

14th day of pseudo-pregnancy. To find whether further mammary development could be obtained by prolonging pseudo-pregnancy, chorionic gonadotrophin was injected at intervals of 4 to 5 days. Further mammary growth was obtained reaching a stage equivalent to the 17th to 18th day of pregnancy but not to full-term pregnancy. Virgin, ovariectomized and male rabbits were injected with 100 to 11,000 I.U. of oestradiol benzoate daily for 17 to 35 days. In all cases the nipples became enlarged and resembled the nipples of rabbits in late pregnancy but the development of the mammary tissue did not approach the full-term state. Some fluid, considered to be a transudate, could be expressed from the glands. When virgin rabbits were injected with an extract of sows' corpora lutea containing 8 to 17 Clauberg units for 5 to 17 days, no nipple growth and only slight glandular development with traces of transudate were observed. Virgin and ovariectomized rabbits were injected with an extract of ox anterior-pituitary glands. After 12 to 14 days, when an equivalent of 10 g. of fresh pituitary tissue had been given, no mammary changes were observed in the ovariectomized rabbits but in the control rabbits both teat and glandular growth occurred, although not to full pregnancy development, and milk was present in the glands. Virgin and ovariectomized rabbits were injected with 1 Corner unit of progesterone and 250 I.U. of oestrogen daily for 7 days; considerable nipple and glandular growth occurred, but when the quantities were increased to 2 Corner units and 250 to 500 I.U. full pregnancy development was obtained. By similar methods fully developed mammary glands were obtained in castrated male rabbits. Full mammary development was obtained when pseudo-pregnant rabbits were injected with 100 to 500 I.U. of oestrogen daily for 20 days. It is concluded that complete mammary development is only obtained when oestrogen and progesterone are acting simultaneously. From studies on the effects of placental extracts on the mammae it is concluded that during the first half of pregnancy the oestrogen and progesterone produced by the ovary together with small quantities of placental oestrogen are responsible for mammary development. In the second half of pregnancy, when the corpus luteum is regressing, mammary development is dependent on placental oestrogen and progesterone.

Experiments with rats and rabbits showed that ovariectomy after parturition or complete removal of the uterus and its contents before parturition did not inhibit the subsequent secretion of milk and it is concluded that the centre for the control of milk secretion lies outside the reproductive tract. Experiments failed to show that

oestrogen and progestogen alone or in combination, were directly responsible for the onset of milk secretion.

When 5 to 10 I.U. of pituitrin was injected daily for 5 to 6 days into rabbits whose mammary glands had been fully developed, the secretory phase was not induced and no milk could be expressed from the glands. It is considered that pituitrin has no direct effect on milk secretion although in the secreting gland by expressing milk from the ducts it may stimulate the secretion of further milk.

Pseudo-pregnant rabbits, after treatment with oestrogen to develop fully the mammary glands, were injected with 1 to 4 ml. of anterior-pituitary extract for 1 to 5 days. Full milk secretion was established within 2 days. Pregnant rabbits injected with 1 ml. of anterior-pituitary extract for 5 days commencing on the 18th day also came into full lactation without any effects detrimental to the foetuses. The action of the anterior-pituitary extract was independent of the integrity of the ovary or female reproductive tract, for castrated male rabbits whose mammary glands had been suitably developed could also be brought into lactation by the extract. It is considered that the extract acts directly on the mammary gland. In the castrated male rabbit, anterior-pituitary extract could also evoke secretion from the mammary gland which had been developed by means of oestrogen alone (mainly duct growth), but considerably larger doses of extract were required than those necessary for inducing secretion in fully developed glands.

Oestrogen, progesterone, oestrogen + progesterone, pituitrin, "prolan," thyroxine and extracts of thymus, pineal body, adrenal and placenta gave negative responses in the pigeon-crop test.

Oestradiol benzoate when injected daily or every second day, commencing on the 1st or 2nd day after littering, in doses of 500 to 25,000 I.U. inhibited lactation in rats, the pups all dying within 6 to 17 days. Since oestradiol benzoate, when injected daily into the pups in doses of 500 I.U. from the 9th day, had no deleterious effect on their growth, it was considered that cessation of growth and the death of the young could not be due to the toxic effects of oestrogen in the mother's milk but must be due to an inhibition of milk secretion. If the mothers were ovariectomized before treatment, no inhibition of lactation was observed when daily doses of 500 to 2,000 I.U. of oestrogen were given. Progestogen in total doses of 7 to 12 Claiberg units given over 13 to 16 days did not affect lactation in rats. The necessity of making histological studies in investigations on milk secretion is stressed.

Huzii concludes that oestrogen and progestogen acting synergistically can stimulate complete mammary development and at the same time prevent the onset of overt milk secretion.

SMITH, R. O. (1949.) **Lymphatic contractility. A possible intrinsic mechanism of lymphatic vessels for the transport of lymph.**—*J. exp. Med.* 90. 497-509. [Author's summary copied *verbatim*.] 1078

The most peripheral lymphatic vessels of rats, mice, and guinea pigs were found to possess a spontaneous intermittent contractility. (a) The rate of contraction was shown to be directly proportional to the rate of formation of lymph and contractions were apparently initiated by an increase in intraluminal pressure. (b) Epinephrine and pituitrin caused an increased contractile rate, or lymphatic spasm, whereas novocaine caused cessation of movement and lymphatic dilatation. (c) Section or electric stimulation of femoral and sciatic nerves did not alter the contractile rate of popliteal lymphatics. This spontaneous lymphatic contractility was not observed in rabbits and dogs although the lymphatic vessels did contract when irritated. Epinephrine, pituitrin, and novocaine produced the same effects as observed in the smaller mammals. Dilatation of lymphatic vessels produced by intradermal injection of fluid, massage, or passive motion was followed by a rapid return of the vessel to normal caliber.

The frequency of valves in lymphatic vessels, the distensibility of the lymphatics and their ability to return to normal caliber against an increased gradient of pressure are considered to be the essential elements of an intrinsic mechanism contributing to the transport of lymph.

MARGULIES, H., & BARKER, N. W. (1949.) **The coagulation time of blood in silicone tubes.**—*Amer. J. med. Sci.* 218. 42-51. [Abst. from authors' summary.] 1079

A means of measuring coagulation time in containers coated with silicone has been described. Normal times in silicone-coated tubes ranged from 25 to 57 minutes, with an average of 38.58 minutes. The effect on the coagulation time of leaving the blood in syringes coated with silicone before it was transferred to glass tubes for testing was recorded on the same subjects. No significant difference was recorded between coagulation times immediately after venipuncture and those obtained on a portion of the same sample left in a silicone-coated syringe for 10 minutes. Patients with clinical evidence of thrombosing tendencies have been studied and abnormally rapid silicone coagulation times seen in a significant number of them. In 18% of patients with acute thrombophlebitis and in 39.3% of patients in whom

spontaneous intravascular clotting occurred the coagulation time was 30 minutes or more. In nearly all of 23 patients who had occlusive arterial diseases the silicone coagulation times were in the normal range.

MARTIN, S. P., KERBY, G. P., & HOLLAND, B. C. (1949.) **A method for measuring removal of bacteria from the blood by the various organs of the intact animal.**—*Proc. Soc. exp. Biol., N.Y.* 72. 63–68. [Authors' summary slightly modified.] 1080

A method of constant intravenous infusion of bacteria combined with the determination of bacterial counts in the circulation at various sites by venous catheterization is described, which provides a means of determining the site of removal and for a quantitative estimate of the rate of removal of bacteria from the blood stream of the intact animal.

In dogs the removal of haemolytic *Micrococcus aureus* by the splanchnic organs averaged $74 \pm 16\%$ (S.D.) Removal by the spleen was $78 \pm 17\%$ (S.D.) No organisms were lost in circulation through the lungs.

In rabbits the removal of encapsulated *Klebsiella pneumoniae* type B by the splanchnic organs averaged $20 \pm 10\%$ (S.D.).

COOPER, K. E., & GREENFIELD, A. D. M. (1949.) **A method for measuring the blood flow in the umbilical vessels.**—*J. Physiol.* 108. 167–176. [Authors' summary copied *verbatim*.] 1081

A method has been developed which enables the rate of blood flow in the umbilical arteries to be measured repeatedly at short intervals, after removal of the foetus from the uterus. Observations may be commenced within 1 min. of removal from the uterus. The relationship between the blood flow in these conditions and that in utero is not known.

COOPER, K. E., GREENFIELD, A. D. M., & HUGGETT, A. ST. G. (1949.) **The umbilical blood flow in the foetal sheep.**—*J. Physiol.* 108. 160–166. [Authors' summary copied *verbatim*.] 1082

The umbilical blood flow has been measured directly by the venous occlusion plethysmographic technique in sheep foetuses between the 60th and the 143rd day of intra-uterine life. The umbilical blood flow/kg. foetal weight ranges from about 250 ml./min. at the earlier ages, to about 180 ml./min. at the later ages. The relationship between the umbilical blood flow/kg. foetal weight/min. and the daily percentage increase in foetal weight at various foetal ages is presented, and it is concluded that there is some proportionality. The results are compared with those obtained previously by indirect methods.

GOEBEL, W. F., & PERLMANN, G. E. (1949.) **The effect of lithium periodate on crystalline bovine serum albumin.**—*J. exp. Med.* 89. 479–489. [Authors' summary copied *verbatim*.] 1083

A study of the chemical, physicochemical, and immunological changes in bovine serum albumin, brought about by oxidation with lithium periodate, has been made. It has been shown that destruction of certain amino acids occurs, that a change in the absorption spectrum takes place, and that the electrophoretic behavior of the protein is altered. Prolonged contact of bovine albumin with lithium periodate destroys its ability to incite antibodies in experimental animals.

MAEGRAITH, B. G., ANDREWS, W. H. H., & WENYON, C. E. M. (1949.) **Studies on the liver circulation. I. Active constriction of the hepatic venous tree in anaphylactic shock.**—*Ann. trop. Med. Parasit.* 43. 225–228. [Authors' summary slightly modified.] 1084

ANDREWS, W. H. H., MAEGRAITH, B. G., & WENYON, C. E. M. (1949.) **Studies on the liver circulation. II. The micro-anatomy of the hepatic circulation.**—*Ibid.* 229–237. [Authors' summary copied *verbatim*.] 1085

I. Antigen injected locally into the livers of sensitized dogs, guinea-pigs and rats gives rise to local congestion. A second small injection into the same site has no further action. A further injection into the portal vein, however, gives rise to widespread congestion.

The authors' interpretation is that local injections cause constriction of the small tributaries of the hepatic vein and that larger injections have a similar effect on the larger tributaries. A small quantity of antigen injected into the liver under anaesthesia sensitizes the whole of the liver, as is shown by congestion on further injections given after an interval of three weeks.

II. A brief review is given of work on the vascular system of the liver. The portal tracts are surrounded by a network of large sinusoids, into which run branches from the portal vein and hepatic artery. Other sinusoids radiate from this network into the lobules. The portal vein sends branches to the lobule via this periportal network. It is also connected by short vessels to a plexus which is present on the bile-ducts. The hepatic artery supplies the tissues of the portal tract, and sends branches to the periportal network. There is some arterial anastomosis, especially on the surface of the liver.

The point at which hepatic arterial blood is mixed with portal venous blood is probably immediately around the portal tract. The bile-duct is surrounded by a plexus which receives branches from the portal vein and the hepatic artery. The drainage of this plexus is into the

sinusoids. Sinusoids drain directly into small central veins. The sublobular veins may receive sinusoids direct, but the sinusoids more usually gather into short trunks, which then run into the veins.

ANON. (1949.) **The action of vitamin A in calcification.**—*S. Afr. med. j.* **23**. 787–788. 1086

The function of vitamin A in neurology and bone formation is briefly discussed. Special notice is drawn to Irving's view (1949), that vitamin A does not affect the osteoclasts but acts solely on the osteoblasts. In the absence of the vitamin these cells engage in disorderly overactivity causing bony overgrowth, whereas in hyper-vitaminosis the action is reversed resulting in fractures.—E. EDEN.

BARCLAY, J. A., COOKE, W. T., & KENNEY, R. A. (1949.) **The renal excretion of inorganic phosphate in man and dog.**—*Acta med. scand.* **134**. 107–116. [In English. Authors' summary copied *verbatim*.] 1087

Phosphate excretion has been studied in man over the range of plasma levels from 3 mg P/100 ml to 10 mg P/100 ml. The results obtained indicate that at normal plasma levels (3–6 mg P/100 ml) phosphate is reabsorbed in proportion to the amount filtered at the glomerulus. Above 6 mg P/100 ml plasma there appears evidence that phosphate is being actively secreted by the renal tubules. This finding has been confirmed on the dog where the phosphate reabsorptive process is saturated at about 6 mg P/100 ml plasma and the secretory process is saturated at 18 mg P/100 ml plasma. The effect of the anaesthetic [nembutal administered intravenously—Ed. V. B.] in lowering the filtration fraction would appear to account for the difference between these results and those obtained by other workers on the intact animal.

GOLDENBERG, M., FABER, M., ALSTON, E. J., & CHARGAFF, E. C. (1949.) **Evidence for the occurrence of nor-epinephrine in the adrenal medulla.**—*Science*. **109**. 534–535. 1088

Using chromatographic methods of analysis it was found that epinephrine from the adrenal medulla of cattle contained 12–36% of nor-epinephrine [nor—a prefix indicating a normal or parent compound], and that the epinephrine fractions from three chromaffin tissue tumours contained between 50–90% of nor-epinephrine.—J. R. PICKFORD.

CROOKE, A. C., & MANDL, A. M. (1949.) **The relative viability of human spermatozoa.**—*J. Hyg., Camb.* **47**. 297–302. [Authors' summary copied *verbatim*.] 1089

A heterogeneous sample consisting of eighteen

specimens of semen provided by eleven patients was examined. Smears were supravitality stained at 3, 8 and 27 hr. Counts of living and dead spermatozoa, classified into normal and fourteen types of abnormal forms, showed that whereas five abnormal forms were always dead, the remaining types showed varying proportions of dead and living cells. Their rate of mortality was somewhat greater than that of normal spermatozoa.

ROZANSKY, R., GUREVITCH, J., BRZEZINSKY, A., & ECKERLING, B. (1949.) **Inhibition of the growth of *Staphylococcus aureus* by human semen.**—*J. Lab. clin. Med.* **34**. 1526–1529. [Authors' summary copied *verbatim*.] 1090

Twenty-eight specimens of human semen were tested for their inhibitory effects on the growth of *Staph. aureus*. Eighty per cent of the specimens inhibited the growth of this organism. Preliminary studies indicate that the active principle is associated with the liquid part of the semen. Some properties of the active principle in the semen are discussed.

HANSSON, A. (1945.) **Dräktighetens inverkan på kornas levande vikt. [The effect of pregnancy on the liveweight of cows.]**—*Kgl. Lantbruksakad. Tidskr.* **84**. 368–380. [Abst. in *Nutr. Abstr. Rev.* **19**. 414. (1949), copied *verbatim*. Signed: I. LEITCH.] 1091

Earlier records of weight loss at calving and birth weight of calves for 5 breeds are summarized in a table. The present series showed that the weight of a cow increased slowly for 3 months and then more quickly, keeping pace with the growth of the foetus. The rate of increase was more uniform in the first than in later pregnancies. Of the loss of weight at calving, the weight of the calf represented 60 per cent. Birth weight increased with the weight of the cow after calving and with age at calving.

ROARK, D. B., & HERMAN, H. A. (1949.) **Comparison of pH values of *in vivo* and *in vitro* determinations on bovine vaginal-cervical mucus.**—*J. Dairy Sci.* **32**. 727. [Only abst. given, abst. from abst.] 1092

pH measurements on vaginal-cervical mucus were made simultaneously *in vivo* and *in vitro* on ten cows during various phases of oestrus. In 30 paired observations the *in vivo* pH values averaged 6.57 and ranged from 0.4–1.33 (average 0.88) lower than *in vitro* values. These differences were considered to be not due to losses of CO₂. The fact that a film is formed about an electrode in contact with moist tissue and that a difference in electrical potential may exist, may be a contributing factor to the observed differences. The authors emphasize the need for further study of the physical and chemical properties of bovine

mucus to improve breeding efficiency by artificial insemination.

V. DRIMMELEN, G. C. (1949.) **Structure of the sperm-nests in the oviduct of the domestic hen.** [Correspondence.]—*Nature, Lond.* **163.** 950–951. 1093

The author reported on the histology of the oviduct of hens killed within one to two weeks after insemination by the intraperitoneal route [see also *V. B.* **16.** 238]. He demonstrated morphologically unaltered spermatozoa 12 days after insemination [see *V. B.* **17.** 269] and had observed "sperm nests" in the infundibular mucosa after similar periods [see *V. B.* **17.** 550]. He considered these "sperm nests" to be identical with the short ducts described by Bradley (1928), but that the non-ciliated epithelial cells found at the fundus are not true goblet cells and that their function might be concerned with maintaining the viability of spermatozoa stored in the sperm nests.—G. P. MARSHALL.

WEISS, R. M., & NOBACK, C. R. (1949.) **The effects of thyroxin and thiouracil on the time of appearance of ossification centers of rat fetuses.** — *Endocrinology.* **45.** 389–395. [Authors' summary copied *verbatim*.] 1094

The time of appearance of the ossification centers studied was not significantly altered in the 16 day-old rat fetuses the mothers of which were injected daily with 1 mg of crystalline thyroxin from either the 6th or the 10th day after pregnancy. The time of appearance of the same ossification centers was definitely delayed in the 16-day-old rat fetuses the mothers of which were fed on a diet containing 0.2 to 0.4% thiouracil from date of pregnancy. On the basis of these results it may be concluded that the thyroid gland has a role in influencing the time of appearance (differentiation) of the ossification centers of membrane bones and primary endochondral bones. Furthermore, it is suggested that thyroid hormone from the maternal thyroid gland may be essential for normal differentiation of the observed ossification centers appearing in 16 day-old rat fetuses.

LAIDLAW, J. C. (1949.) **Nature of the circulating thyroid hormone.** [Correspondence.]—*Nature, Lond.* **164.** 927–928. 1095

Five groups of three rats, each animal being given a single intraperitoneal injection of 80 microcuries of iodine- I^{131} as sodium iodide, were bled 24 or 48 hours after the injection. Determinations of total and protein-bound radio-active iodine were carried out on one portion of the plasma. Another portion was extracted with butanol, giving thyroxin and inorganic iodine; from this the thyroxin iodine was obtained by removing the inorganic iodine with alkali treat-

ment. Paper chromatography with added thyroxin demonstrated that the iodine in this fraction was in fact part of thyroxin. In the three experiments in which blood was withdrawn 24 hours after the injection the thyroxin fraction contained 31, 58 and 26% of the total plasma iodine. Similar values obtained 48 hours after injection were 59 and 63%. L. considers that the circulating thyroid hormone is thyroxin and not thyroglobulin or a thyroxin containing peptide.—E. E.

SEIFTER, J., BAEDER, D. H., & BEGANY, A. J. (1949.) **Influence of hyaluronidase and steroids on permeability of synovial membrane.**—*Proc. Soc. exp. Biol., N.Y.* **72.** 277–282. [Authors' summary and conclusions copied *verbatim*.] 1096

The permeability of the synovial membrane as measured by speed of absorption and excretion into the urine of phenolsulphonphthalein (PSP) instilled into the joint was found to be surprisingly constant in a group of 16 normal rabbits.

Hyaluronidase markedly increased permeability of the synovial membrane. The effect was maximal and was not augmented by desoxycorticosterone acetate (DOCA).

Adrenal cortical extract decreased permeability of the synovial membrane and antagonized the effect of hyaluronidase. This effect of adrenal steroids was more pronounced when they were released endogenously by the alarm reaction. Estrone also decreased the permeability of synovial membrane.

Desoxycorticosterone increased maximally the permeability of synovial membrane to the same extent as hyaluronidase and could not be augmented by hyaluronidase.

It is suggested that the normal permeability of the synovial membrane is in part controlled by the balance between adrenal steroids of the DOCA type and of the Compound E type.

These findings are consistent with current views of the etiology of rheumatoid arthritis either by hyaluronidases or from exposure to stressing stimuli. They are also consistent with the therapeutic effects of Compound E or of adrenocorticotrophic hormone in the treatment of arthritis.

OPSAHL, J. C. (1949.) **The role of certain steroids in the adrenal-hyaluronidase relationship.**—*Yale J. Biol. Med.* **22.** 115–121. [Author's conclusions copied *verbatim*.] 1097

Compound E and, to a lesser extent, Compound A inhibit the spreading of intradermally injected India ink with hyaluronidase. Testosterone, estradiol benzoate, progesterone, and pregnenolone, when tested under conditions necessary for the optimal inhibitory activity of adrenal cortical extracts, did not have a definite influence on the spreading phenomenon. The

evidence suggests that inhibition of the spreading reaction by the adrenal hormones is restricted to steroids that have an oxygen at Carbon-11.

JOHNSTON, J. E., STONE, E. J., & MIXNER, J. P. (1949.) **Hyaluronidase relationships in dairy bull semen.**—*J. Dairy Sci.* **32**. 574-579. 1098

One hundred semen samples from 22 dairy bulls were examined for the following characteristics: initial hyaluronidase content, hyaluronidase content after 24 hours at 37°C., spermatozoa concentration, spermatozoa per ejaculate, semen volume, initial motility as judged on an arbitrary scale, persistence of motility when stored at 5°C. as whole semen or after dilution 1:10 with egg-yolk-citrate-sulphanilamide diluent, initial percentage live spermatozoa (diluted semen), and

See also *absts.* 957 (role of milk and colostrum in mule foal jaundice); 1002 (amino acid in milk and colostrum); 1174 (textbook, histology); 1179 (book, thyroid hormones).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

RAMSBOTTOM, J. M., & STRANDINE, E. J. (1948.) **Comparative tenderness and identification of muscles in wholesale beef cuts.**—*Food Res.* **13**. 815-830. [Abst. in *Stain. Tech.* **24**. 198. (1949), copied *verbatim*. Signed: WILLIAM G. WALTER.] 1099

Fifty of the larger muscles were dissected from the wholesale cuts of three U. S. good beef carcasses. They were weighed and their percentage of the total weight in each wholesale cut was recorded. Moisture, fat, and pH determinations were made. Tenderness was determined by committee rating, histological rating, and a shearing device.

Representative samples of both raw and cooked muscles were prepared for histological examination. Small pieces of the raw muscles were fixed in 10% formalin, dehydrated in alcohol, embedded in paraffin, and sectioned. Weigert's elastic connective tissue stain was used to show the distribution of the elastic connective tissue, while Mallory's triple connective tissue stain was used to demonstrate the collagenous connective tissue. From the cooked muscles larger samples of muscles (approximately $1\frac{1}{2} \times \frac{3}{4}$ inches) were sectioned on the freezing microtome and stained with gentian violet and Sudan III.

The beef muscles varied greatly in weight, moisture and fat content, pH, and tenderness. It is apparent from these data that the commercial practice of grouping muscles of similar tenderness should be extended, so that the occurrence of both tough and tender muscles within a roast or steak would be eliminated in so far as it is practical.

GINSBERG, A., & ROBERTSON, A. (1949.) **The examination of minced meat.**—*Vet. Rec.* **61**. 540-543. 1100

A series of tests designed to detect substitu-

percentage of spermatozoa (diluted semen) surviving a cold shock (10 min. at 5°C.). Analysis of variance indicated that the hyaluronidase titres at 0 hours and at 24 hours were very significantly related to spermatozoa concentration.

First order partial correlations (independent of effects of spermatozoa concentration) of hyaluronidase titres with each of the remaining semen characteristics were calculated. No significant values were found except those between initial hyaluronidase titre and (a) initial percentage of live spermatozoa and (b) percentage of live spermatozoa surviving cold shock; both values being negative. These findings are discussed in relation to the liberation of hyaluronidase by spermatozoa.—R. J. FITZPATRICK.

tion and incipient putrefaction is given. The authors found that rapid decomposition occurred at pH 6.8 and it may also occur at a pH as low as 5.7. If all tests including histological examination and precipitin tests are used, a fair picture of the sample can be obtained.—R. MACGREGOR.

RICHARD, A. (1949.) **Asphyxie par les gaz des viandes en voie de putréfaction. [Asphyxiation by gases from putrid meat.]**—*Rec. Méd. vét.* **125**. 116-117. 1101

A cargo boat carrying 750 tons of frozen beef, damaged in collision and the refrigerating machinery out of action, arrived in Port Said with some water in the holds. R. states that five men unloading the meat died from sulphuretted hydrogen poisoning and two others were ill, the unloading being completed in gas masks. No details were given.—R. MACGREGOR.

DE, N. K., RANGATHAN, S., & SUNDARARAJAN, A. R. (1946.) **Vitamin A and carotene content of ghee (clarified butter) and fortified margarine.**—*Indian J. med. Res.* **34**. 8-12. 1102

In ghee prepared from the milk of well-fed cross-bred cows, non-saponifiable fractions contained 6.5-17.5 (mean 11.4) international units per g. of carotene and 21.6-32.8 (mean 25.1) I.U. per g. of vitamin A. Buffalo ghee contained no carotene; the vitamin A content ranged from a trace to 18 I.U. per g. Both ghee and margarine fortified with vitamin A lost much of their vitamin A activity when heated to 130°-170°C. for 20 min., the loss being much greater in the case of margarine.—S. N. RAY.

DAVIDSON, R. S. (1949.) **An outbreak of food poisoning.**—*Med. Offr.* **82**. 169. 1103

Vanilla slices from a baker and confectioner sold to the public resulted in over 60 cases of food

poisoning, including one fatal case, the cause being *Salmonella typhi-murium*, probably derived from duck eggs used in the manufacture of the vanilla filling and well disseminated throughout the filling by an electric mixer.

POKORNÝ, V. (1948.) Veterinární poměry v Rumunsku a v Maďarsku. [**Veterinary conditions in Roumania and Hungary.**—*Čas. československ. Vet.* 3. 543-544. 1104

Roumanian veterinary service is nationalized and is affiliated to the department of animal husbandry of the ministry of agriculture. There are 12 regions, each of which is divided into veterinary districts. Every district consists of subdistricts comprising 3-8 communities. In

See also absts. 998 and 1157 (D.D.T. in milk).

LIVESTOCK HYGIENE

POULSEN, E. (1949.) Varmerisolation af staldbygninger. [**Heat insulation of animal houses.**]—*Forsøgslab. København Beretn.* No. 238. pp. 267. [Abst. in *Nutr. Abstr. Rev.* 19. 474-475. (1949), copied *verbatim*. Signed: J. R. MCLAGAN.] 1105

This report is partly an account of investigations and partly an instruction manual for planners of farm buildings. The measurements on which it is based were made on 30 holdings. The conditions found on the larger holdings were satisfactory; on small holdings the loss of heat per cow was almost twice as great. Figures have been calculated for conduction of heat and transmission coefficients for materials and conditions found in Denmark. In earlier measurements it was calculated that the total loss of heat in the ventilating air from a cowhouse was of the order of 767 Cal. per cow per hr. With a heat production of about 18,650 Cal. per cow daily, of which about 500 Cal. per hr. was accounted for by radiation (free heat) and evaporation of water from the cow, there was a surplus of about 267 Cal. per hr. to balance evaporation from and transmission to the stall. If the losses from these 2 causes exceed that estimate, further insulation is required. Figures are also given for pig houses, together with a method for making these calculations. It is emphasised that heat insulation must be considered when first planning a building. Proper heat insulation will help to prevent the condensation of moisture on the outer walls. The transmission of vapour through an outer wall is discussed and some constants of diffusion are given. Different principles of stable insulation are commented on and reasons are given for preferring outward to inward insulation and the insulation of windows and doors to that of walls, although the latter is cheaper for the same per-

centage of heat saved. A form is proposed for making measurements in a wider survey of buildings.

BORTS, I. H. (1949.) **Water-borne diseases.**—*Amer. J. publ. Hlth.* 39. 974-978. [Author's conclusions amended.] 1106

Water-borne outbreaks [in human beings] of disease from public water supplies have been practically eliminated in the United States save for those due to accidents and breaks in sanitation. Data are presented showing the relationship of nitrates in rural water supplies to the depths of the wells. Sixty-nine cases of infant cyanosis associated with the presence of nitrates in rural water supplies are reported. There appears to be close correlation between the nitrogen content of rural water supplies containing nitrates and their coliform content. Accumulated data suggest that in cyanosis emergencies, water from properly constructed drilled wells over 200 ft. in depth may be tentatively substituted for the preparation of infants' food until safety tests can be adequately checked.

NEEFE, J. R., STOKES, J., Jr., BATY, J. B., & REINHOLD, J. G. (1945.) **Disinfection of water containing causative agent of infectious (epidemic) hepatitis.**—*J. Amer. med. Ass.* 128. 1076-1080. [Abst. in *Bull. Hyg., Lond.* 21. 82-83. (1946), slightly modified. Signed: F. O. MACCALLUM.] 1107

In a previous paper [see *V.B.* 18. 459.] the authors described an epidemic of infective hepatitis [in human beings] which was probably caused by contamination of well-water with infected sewage. As a result of this they have tested the effect of the common methods of disinfection of drinking water on water known to be infected with the agent of infective hepatitis of

human beings. The source of the infective agent was the pool of faeces described in their previous paper, which had produced jaundice in 10 of 22 recipients. The treated material was tested by being given orally to human volunteers.

It was found that the agent was not inactivated or attenuated by 40 minutes' contact with sufficient chlorine to provide a residual chlorine concentration of 1 part per million after 80 minutes' contact. When exposed to 25 parts per million of chlorine, with a residual chlorine content of 15 parts per million after 80 minutes' contact, the agent appeared to have been nearly completely inactivated. Sera of four of the five recipients gave positive cephalin flocculation reactions between the 42nd and 67th days, though no other tests for abnormal liver function were positive.

Treatment of the contaminated water with sodium carbonate, aluminium sulphate and activated carbon did not completely remove or inactivate the hepatitis agent.

NEEFE, J. R., BATY, J. B., REINHOLD, J. G., & STOKES, J. (1947.) *Inactivation of the virus of infectious hepatitis in drinking water.*—*Amer. J. publ. Hlth.* 37. 865-872. [Authors' summary slightly modified.] 1108

The effect of certain procedures commonly employed in the disinfection of drinking water on a virus of infectious (epidemic) hepatitis of human beings has been investigated with the following results: Coagulation, settling, and filtration (diatomite filter) of contaminated water did not eliminate or inactivate the hepatitis virus as the disease developed in 40 per cent of the volunteers who ingested such treated water. However, this treatment resulted in a prolongation of the incubation period and a 40 per cent decrease in the incidence as compared with that in the control group. The application to such water (previously coagulated, settled, and filtered) of sufficient chlorine to provide, after 80 minutes' contact, total and free residual chlorine concentrations of 1.1 and 0.4 p.p.m. respectively apparently was adequate to inactivate the hepatitis virus under the conditions of this experiment. However, the same 80 minute residual total chlorine concentration (1 p.p.m.) in contaminated water that had not been pretreated by coagulation, settling, and filtration did not inactivate the hepatitis virus.

The complete control of the hepatitis virus (and probably other infectious agents) in drinking water depends almost entirely on the disinfectant as the virus is not eliminated or inactivated by preliminary coagulation, settling, and filtration of the water. The efficiency of the disinfectant varies with the character of the water and the resistance of the infectious agent concerned. Dosages of chlorine that are adequate for inactivation of the

bacterial pathogens occurring in drinking water may not be adequate for the hepatitis virus, particularly if the water has a high content of unoxidized organic material. Conclusions regarding the adequacy, in respect to the hepatitis virus, of the dosages of chlorine ordinarily applied for the disinfection of water must await the determination of the minimal effective dose of chlorine in coagulated, settled, and filtered water.

ALLEN, L. A., BROOKS, E., & WILLIAMS, I. L. (1949.) *Effect of treatment at the sewage works on the numbers and types of bacteria in sewage.*—*J. Hyg., Camb.* 47. 303-319. [Authors' summary and conclusions copied *verbatim*.] 1109

Over a period of about 10 months samples were taken at frequent intervals from various stages of treatment at two sewage works; one of these was a small rural works treating only domestic sewage, and the other treated the sewage of an industrial town. These samples were submitted to bacteriological and to chemical examination.

The total plate counts, the counts of *coli-aerogenes* bacteria, and the counts of *Streptococcus faecalis* in settled sewage were higher in the warmer than in the colder months of the year. Though the average total numbers of bacteria in the sewage containing trade wastes were appreciably higher than that of the domestic sewage the counts of faecal organisms were somewhat lower.

Treatment at the works considerably reduced not only the polluting strength of the sewage but also the numbers of bacteria. At the works receiving sewage from an industrial town an average of about 80 % of bacteria in settled sewage were removed by treatment in the bio-aeration plant, percolating filters, and humus tanks, and a further 8-10 % were removed by subsequent treatment in pressure sand or anthracite filters. At the small rural works, where the rate of treatment was much lower, rather more than 90 % of the bacteria were, on the average, removed by treatment in percolating filters and humus tanks, and a further 6 % by subsequent passage through shallow gravity sand filters.

The final effluents discharged from the works still contained large numbers of bacteria. Their effect on the bacterial content of the streams to which they are discharged may be gauged from the fact that, in the effluent from the small rural sewage works, which was of consistently good quality when judged by chemical criteria, there were on the average about 160,000 cells of faecal *Bacterium coli* and about 20,000 faecal streptococci per 100 ml. Numbers in the effluent from the works in the industrial town were even higher. Sand filters of the type investigated here could therefore not be relied upon to produce an effluent of good bacterial quality.

The 44°C. test in MacConkey broth, prescribed by the Ministry of Health (1939) for examination of water, was found, when applied to samples of sewage or sewage effluent, to be almost specific for *Bacterium coli*, type I. Growth with formation of acid in sodium azide broth incubated at 45°C. was found to be an almost specific test for *Streptococcus faecalis*.

SMITH, R. F., FULLMER, O. H., & MESSENGER, P. S. (1948.) **DDT residues on alfalfa hay and seed chaff.**—*J. econ. Ent.* **41**. 755-758. [Authors' conclusions copied *verbatim*.] 1110

Alfalfa hay and alfalfa straw from a wide range of localities in California have been analyzed for DDT following spraying and dusting. Straw

from alfalfa seed fields which had been dusted for lygus bugs [*Lygaeidae*—Ed. V. B.] with five per cent DDT showed from 0.0 to 20.0 ppm even after long weathering periods. Alfalfa hay from fields treated with DDT for the control of the alfalfa butterfly [*Colias philodice eurytheme*—Ed. V. B.] showed a variable amount of DDT due to variations in application, growth of the alfalfa, weathering, and moisture content of the hay. It ranged for dusts from 0.0 to 1.9 ppm at the lower dosage (30 pounds of 0.5 per cent DDT per acre), and from 3.7 to 10.3 ppm at the higher dosages (30 pounds of 5 per cent DDT per acre). For sprays, it ranged from 0.0 to 12.1 ppm for 0.25 pound of actual DDT per acre, and from 36.4 to 47.2 for 1 pound of actual DDT per acre.

REPRODUCTION AND REPRODUCTIVE DISORDERS

CHENG, P., CASIDA, L. E., & BARRETT, G. R. (1949.) **Effects of dilution on motility of bull spermatozoa and the relation between motility in high dilution and fertility.**—*J. Anim. Sci.* **8**. 81-88. 1111

To study the effect of high dilution upon motility of bull spermatozoa, six semen samples from each of five bulls were diluted with 0.9 % sodium chloride and 0.08 M. sodium citrate, both at a dilution of 1:10, and also in eight successive dilutions from 1:100 to 1:12,800. The diluted semen was maintained at 37.5°C. for 90 min. and the percentage of motile spermatozoa determined.

A similar experiment on 11 samples from eight bulls was carried out to compare 0.08 M. sodium citrate as a diluent with 0.133 M. sodium citrate + equal parts egg yolk. Dilution with either sodium chloride or sodium citrate markedly reduced motility, the reduction being greater with the citrate than with the chloride, although in the maximum dilution which would support motility it was maintained in a greater dilution of citrate than of chloride. Egg yolk had a marked protective action against dilution.

Three hundred and thirty-seven inseminations were carried out with the six samples from each of five bulls and fertility estimated by pregnancy diagnosis at 34-48 days after insemination. In samples from the same bull there was no significant correlation between motility and fertility.—E. J. H. FORD.

SWANSON, E. W. (1949.) **The effect of varying proportions of egg yolk and sodium citrate buffer in bull semen diluters upon sperm motility.**—*J. Dairy Sci.* **32**. 345-352. 1112

In view of the wide variation in the concentration of sodium citrate and egg yolk used by various workers as a semen diluent, S. carried out

trials to determine the optimum concentration of these substances for routine use.

In the first trials semen was diluted with a mixture of three parts of citrate solution of concentration varying from 1-5 %, and 1 part of egg yolk, maintained at a temperature of 5°C. for ten days, the percentage of motile spermatozoa being determined daily. Averages from ten semen specimens showed that motility was best maintained using 3 % sodium citrate. The freezing point of this diluent was the same as that of fresh bull semen.

In a second series of trials diluent was prepared from a mixture of 3 % sodium citrate and varying percentages of egg yolk. There was little to choose between concentrations of egg yolk of 50-20 % as preservers of motility. 10 % egg yolk was protective against rapid cooling. [In view of such statements as "Diluted at the rate of 1 part of semen to 10 or 20 parts of each diluter," and "The semen generally was diluted at the rate of 1 part of semen to 10 parts diluter," it is difficult to assess the final concentration of either sodium citrate or of egg yolk in the diluted semen.]

—E. J. H. FORD.

SCHULTZE, A. B., & DAVIS, H. P. (1949.) **Effect of thyroxine on fertility of bovine semen.**—*J. Dairy Sci.* **32**. 322-326. 1113

Semen samples from 18 bulls were divided into two parts. One part was diluted with egg yolk phosphate buffer and sent to a group of insemination associations for use, and the other part of each sample was diluted with egg yolk phosphate buffer containing added D,L-thyroxine in a final concentration of 10 µg. in 100 ml. diluted semen and sent to another group of stations. The percentage of no returns at five months was 2.7 greater for thyroxine treated samples used after one

day's storage, and 8.1 greater for treated samples used after four days' storage, than for corresponding control semen. These differences were statistically significant.—E. J. H. FORD.

ALMQUIST, J. O. (1949.) **The effect of penicillin upon the fertility of semen from relatively infertile bulls.**—*J. Dairy Sci.* 32. 950–954. [Author's summary copied *verbatim*.] 1114

Penicillin was added to the semen of five relatively infertile bulls at the rate of 250, 500, 750 and 1,000 units per ml. of diluter. Based on 3,576 inseminations, levels of penicillin of 500 and 1,000 units brought about highly significant increases in fertility of 18.4 and 15.3 per cent of the cows inseminated, respectively. The 250 and 750 unit concentrations each showed average increases of 8.7 percentage units over the controls and these differences approached significance. Greatest improvement in breeding efficiency was obtained with 1,000 units of penicillin per ml. of diluter.

The variation in results among the bulls indicated that penicillin had a very beneficial effect upon the semen from certain bulls of lowered fertility, while failing to be of significant value when added to the semen of other bulls. Thus, three of the five bulls showed large increases in fertility of 14.5, 21.1 and 31.6 percentage units when 1,000 units of penicillin were added per ml. of diluter. Of the remaining bulls, one showed a small increase of 4.1 percent while the other showed no beneficial response.

LEISTNER, E. (1949.) **Erfahrungen bei der Sterilitätsbehandlung von 600 Rottaler Stuten im Frühjahr 1948.** [Treatment of sterility in 600 mares.]—*Tierärztl. Umsch.* 4. 75–78. 1115

Of 600 infertile Rottaler mares examined in the spring of 1948, 24.8% had abnormalities of the oestrous cycle, presumably resulting from the preceding dry summer. Uterine infection resulting from previous abnormal parturition accounted for 13.5% of infertile mares.—R. ROSS-RAHTE.

SEFTON, D. J. (1948.) **Problems of a thoroughbred breeding establishment.**—*Aust. vet. J.* 24. 245–250. 1116

The management of thoroughbred breeding studs under Australian conditions is discussed. Mating is from mid-September to early December, for foaling as soon after 1st August as possible.

Mares are commonly sent to the stud establishment just before foaling. A teaser is generally used to determine the onset of oestrus. The frequent absence of oestrus in dry mares, even after treatment with stilboestrol, presents a major problem. Pregnancy tests are resorted to by most studmasters. An early test, 40–45 days after service, by injecting mice with the mare's serum

makes a second service practicable. After 120 days the Cuboni urine test permits the segregation of empty mares. Dystocia and retained placenta occur in 1–2% of foaling mares, retained membranes being a common cause of subsequent breeding failures. Most cases of septic metritis are caused by retention of cornual segments of the placenta.

Among growing foals, internal parasites are prevalent. Faecal examination is advisable, followed by phenothiazine treatment when indicated. Other disorders include omphalitis, which responds well to sulphonamide and penicillin therapy, and infection with *Corynebacterium equi*, in which treatment is ineffective.—G. F. FINLAY.

DEVISME, M.-E.-C. (1946.) **Les sulfamidés dans la prophylaxie et le traitement de la métrite aiguë et de la fourbure de parturition chez la jument.** [Sulphonamides in treatment of acute metritis and laminitis in mares.]—*Thesis, Alfort*. pp. 58. 1117

The general and local symptoms of acute *post-partum* metritis are described. The condition often becomes chronic. Laminitis, frequently associated with metritis, rapidly becomes chronic. It should be regarded as a localization of the same infection in the foot. To prevent or treat both conditions D. used sulphanilamide, soluseptasine, or soluthiazomide, all of which are bacteriostatic. The prophylactic administration of these drugs is emphasized, either *per os* or by intra-uterine or intravenous injection.—W.R.B.

FOOT, A. S., & RIDLER, B. (1949.) **Dairy herd fertility.**—*Empire J. exp. Agric.* 17. 229–237. [Authors' summary copied *verbatim*.] 1118

A survey has been made of the breeding records of a large herd of dairy cows over a period of 10 years with the object of assessing the fertility of the herd.

Absolute sterility appears to have accounted for less than 5 per cent. of the herd each year but delay in getting cows in calf appears to have been a partial reason for disposal of a further small percentage.

Of 151 animals, all of which had been unsuccessfully served twice, 110 were eventually got in calf, 94 with either 1 or 2 further services.

Maiden heifers and 1st-calf cows showed a lower conception rate than older age-groups. This may not be due to age *per se* but may be due to culling of animals naturally infertile from the older groups.

Conception was achieved in 27 out of 33 cases that were treated for failure to come in season, but in only 9 cases out of 20 that were treated after persistently turning to the bull.

Pregnancy diagnosis by palpation per rectum

has been about 98 per cent. accurate in the case of cows diagnosed pregnant and 88 per cent. accurate in the case of cows diagnosed non-pregnant. Accuracy of this order has been obtained in some cows about 2 months only after service.

KALUSCH, A. (1949.) Die Bekämpfung der übertragbaren Geschlechtskrankheiten (Deckseuchen) der Rinder. [The control of venereal diseases in cattle.]—*Wien. tierärztl. Mschr.* 36. 169–173. 1119

K. comments on the new law passed by the Austrian government to protect cattle against trichomoniasis, contagious vaginal catarrh and enzootic sterility.—R. ROSS-RAHTE.

ROBINSON, T. J. (1949.) Oestrogenic potency of subterranean clover (*T. subterraneum* L. var. *Dwalganup*): the preparation and assay of extracts.—*Aust. J. exp. Biol. med. Sci.* 27. 297–305. 1120

In a study of the genetic and environmental factors which might influence the oestrogenic potency of various subterranean clovers R. attempted to develop a suitable assay method using inbred albino mice and "increase of uterine weight was taken as the indicator of oestrogenic potency". He is of the opinion that the oestrogenic potency is confined to the leaves alone. A method for determining the potency of clover samples is given.—J. K. GAN.

PEETERS, G., MASSART, L., OYAERT, W., & THOONEN, J. (1949.) The influence of udder trauma on the growth of this organ in maiden ewes.—*Arch. int. Pharmacodyn.* 75. 256–260. [Abst. in *Anim. Breed. Abstr.* 17. 257. (1949), slightly modified. Signed: G. R. R.] 1121

Three out of 6 ewes born in the spring of 1947 were ovariectomised in July 1947; 3 weeks later the teats, udder, and vulva of the operated animals were completely atrophic. A section of udder weighing about 5 g. was excised from about 1 in. above the base of the left teat. A fortnight later a similar excision was made from the right half of the udder. As a result, a lactation, similar to that induced by oestrogen, was stimulated in both halves of the udder, and lasted until the 4th week after the start of the experiment; 10–30 ml. milk was obtained daily and there was definite growth of the udder. The response was less in the ovariectomised ewes in which the atrophic vulva became red and oedematous. Histological examination confirmed proliferation of the mammary gland, and chemical examination showed an increased percentage of ribonucleoproteins.

HILLERSON, A. M. (1949.) Hemorrhagic diathesis in new-born puppies.—*Vet. Ext. Quart. Univ. Pa.* No. 116. pp. 22–23. 1122

A case report of an unexplained condition.

A two-year-old cocker spaniel bitch bore four apparently normal puppies, two of each sex. The puppies developed haemorrhages from the pads of the feet 36–38 hours later. There were no haemorrhages elsewhere, no icterus, the faeces were normal and in other respects the puppies appeared in good health. The haemorrhages ceased two hours after the puppies had received 6 ml. of whole blood, 2 ml. of calcium borogluconate and 0.1 mg. vitamin K in oil, all intramuscularly. Further progress was uneventful.

—G. FULTON ROBERTS.

WRIGHT, M. M., & DUDLEY, F. J. (1948.) Some observations on slip wing in ducks.—*Harper Adams Util. Poult. J.* 33. 30–31. 1123

A small-scale experiment was designed to find out if this abnormality was inherited. Three normal and three slip wing ducks were mated with a slip wing drake. After four clutches of eggs had been set a normal wing drake was substituted for the slip wing drake and three further clutches set.

Results were not conclusive and it was not possible to separate hereditary from seasonal influences. Male progeny developed the condition more frequently than females.—D. LUKE.

BRATANOV, P. P. (1949.) [Early pregnancy diagnosis test with *Rana esculenta ridibunda*, and with *Rana temporaria*, *agilis*, *graeca* and *Bufo viridis*.] pp. 14. Sofia: Separate reprint from the monthly medical periodical *Clinica Bulgara*, Year XX, volume 7, pp. 538–546 (English 546–548), September, 1949. 1124

Male *Rana esculenta ridibunda* were successfully used as test animals for pregnancy diagnosis in women. Either 3 ml. of urine or 1.5 ml. blood serum were injected into the lymph sacs of a male frog (about 30 g. body weight). In positive cases spermatozoa were present in the urine within three hours of the injection. In 586 women tested, 327 positive tests all proved to be correct. Of 259 negative tests, five proved to be false negatives. It is believed that false negative results could probably be avoided if after a negative result a second frog were injected with urine from the same sample. Spontaneous spermaturia was not observed in the frogs, even during the normal spawning season.

Satisfactory results were also obtained with male *R. agilis*, *R. temporaria*, *R. graeca* and *Bufo viridis*; female frogs were also injected, but no oviposition occurred with either pregnancy urine or serum. False negative results were consistently obtained when samples of urine and blood from pregnant mares, cows, donkeys, sows and ewes were used.

[See TABARELLI NETO. *V.B.* 19. 634.]

—ALFRED T. COWIE.

BHADURI, J. L., & BARDHAN, N. R. (1949.) A preliminary note on the use of the male toad *Bufo melanostictus* Schneid., as a test animal for bovine pregnancy.—*Sci. & Cult.* 15. pp. 78–80. 1125

A few hours after the injection of gonadotrophin into a male toad, spermatozoa can be detected in the urine in the cloaca. This reaction is now being successfully used as a means of detecting gonadotrophin in the urine of women for early pregnancy diagnosis. The authors have tested out the effect of injecting specimens of untreated morning urine from pregnant cows (2, 4 and 9 months' gestation) into male toads (*Bufo melanostictus*), but in no case did a positive result ensue even after three doses of 5 ml. given at hourly intervals. When, however, aqueous extracts of pregnant cows' faeces were injected, more promising results were obtained. 15 g. of faeces were stirred in to 100 ml. of water and after straining, the liquid was centrifuged. The supernatant fluid was filtered and 5 ml. were injected into the subcutaneous lymph sac of the toad. The

toads were kept in room temperature (35.2°C.) and their urine examined for spermatozoa half-an-hour and 1 hour after injection. If the test gave a negative result at 1 hour another 5 ml. of material was injected, up to four injections of 5 ml. each being given in negative cases at hourly intervals. Faeces samples from eight pregnant cows (55–260 days' gestation) gave positive results within 1½–4 hours of injection, whereas faeces samples from four non-pregnant cows gave negative results even when a total of 25 ml. solution had been injected. The authors conclude that while these preliminary results suggest that the test may be of considerable value for the early diagnosis of pregnancy in the cow, many more samples must be examined to establish the validity of the test. Furthermore, since the toad test is generally believed to be specific for gonadotrophic substances, the faecal excretion of gonadotrophins by the pregnant cow would appear to be of considerable physiological interest.

[See preceding abst. and *V. B.* 20. 173.]

—ALFRED T. COWIE.

See also absts. 952-958 (haemolytic jaundice); 1091 (pregnancy and weight of cows); 1093 (sperm nests in oviduct of hen); 1098 (hyaluronidase and bull semen).

ZOOTEC H N Y

LOUW, D. J., HAVENGA, C. M., & HAMERSMA, J. (1948.) The walking habits of sheep.—*Fmg S. Afr.* 23. 753–755. 1126

The ability of sheep to walk great distances in search of food is of importance in their adaptation to life in arid regions. Observations were made on ewes of the following breeds, Black-head Persian, Merino, Karakul and Dorset × Persian in an enclosure measuring 1,000 by 1,500 yards. This area was divided into 800 yard squares marked by flags which enabled the position of the sheep to be determined by means of binoculars and plotted on a map at hourly intervals. To check the results obtained the experiment was repeated using two adjoining enclosures. It was found that the Black-head Persians and the Dorset × Persians walked more than the Karakuls or Merinos. All the sheep walked more in the summer than in the winter, probably on account of the longer days. All the sheep drank water once a day except the Merinos, which skipped a day. —M. C.

and discussed with reference to the present findings. The application of the observations to the feeding of young elephants is considered. The average percentage composition of a suitable, artificially enriched cow's milk was fat 6.6, protein 3.2, lactose 5.4, ash 0.7, and Ca 0.117.

HIGHMAN, B., & ALTLAND, P. D. (1949.) Acclimatization response and pathologic changes in rats at an altitude of 25,000 feet.—*Arch. Path.* 48. 503–515. [Authors' summary copied *verbatim*.] 1128

Rats were exposed to a simulated altitude of 25,000 feet four hours daily, starting at 14 days of age. Hematocrit readings, oxyhemoglobin concentrations and erythrocyte counts increased gradually during the first 100 days and persisted at high levels. The mortality was high after 100 days of age, and none lived more than half of the normal life span. Nearly all of the exposed rats had striking vascular engorgement and severe lesions in various organs. The heart was usually distinctly hypertrophied, the valves were often thickened, and vegetations were found principally on the mitral, and less frequently on the aortic and tricuspid valves and in the auricles. In addition, many of the rats showed fibrosis of the inner portion of the wall of the left ventricle and fatty and various other degenerative changes in the myocardium, and one rat presented coronary occlusion with infarction. Infarcts were frequently

ANSELMI, S., & CALÒ, A. (1949.) Sul latte di elefante. [Elephant's milk.]—*Ann. Chim. appl., Roma.* 39. 100–108. [Abst. in *Nutr. Abstr. Rev.* 19. 301. (1949), copied *verbatim*. Signed: A. M. COPPING.] 1127

Analyses are reported of milk from a lactating elephant in the Zoological Gardens in Rome. Figures reported by other observers are quoted

found in the kidneys. Many kidneys also showed marked hemosiderosis and a lesser number, numerous hemoglobin casts and fatty changes in the media of some arteries or in the epithelium of some tubules. Some rats showed gross hematuria.

A large proportion of the rats that died had a massive accumulation of blood in the intestine, but only a relatively small number had ulcers in the intestine or the stomach. Hemorrhages were also found in the central nervous system.

These findings indicate that rats are unable to acclimatize fully to short daily exposures to a simulated altitude of 25,000 feet. It is suggested that discontinuous exposure of laboratory animals to simulated high altitudes may be a useful experimental method for the production and study of cardiovascular and other lesions.

ALTLAND, P. D. (1949.) **Effect of discontinuous exposure to 25,000 feet simulated altitude on growth and reproduction of the albino rat.**—*J. Exp. Zool.* 110. 1-17. [Abst. in *Nutr. Abstr. Rev.* 19. 412. (1949), copied *verbatim*. Signed: J. RIDLEY.] 1129

A group of 247 Sprague Dawley rats was exposed to a simulated altitude of 25,000 ft. for 4 hr. daily from 14 days of age until they were selected for autopsy or died. During the exposure period, 288 control animals were deprived of food and water and subjected to the noise of the vacuum pump. During the first 100 experimental days bodyweights of all animals were recorded daily, and after this time at 5-day intervals. The ovaries, the uterus and oviducts, the right testis, the right epididymis and the seminal vesicles were removed, weighed and histologically examined. Daily vaginal smears revealed the nature of the oestrous cycles in the exposed rats.

Growth was retarded in the exposed rats of both sexes, most noticeably during the 6 weeks

See also abst. 974 (hides).

TECHNIQUE AND APPARATUS

SCHAIN, P., MAGDALIN, S., & RUSSO, A. (1948.) **Sputum examination. A comparative study of the Clorox and Tergitol-Javelle water concentration methods.**—*Amer. Rev. Tuberc.* 57. 640-643. [English and Spanish summaries, English summary copied *verbatim*.] 1130

Examination of 200 specimens of sputum, which had been negative by direct smear on at least three examinations, revealed acid-fast bacilli in 85 per cent of those treated with the Tergitol-Javelle Water reagent and in 27 per cent of those prepared with Clorox.

The time required for a satisfactory microscopic examination when using the Tergitol-Javelle Water method was approximately one-half to one-third that required with the use of Clorox.

after weaning. The bodyweight of the exposed males was on the average 86.8 per cent. less than that of the controls at 60 days of age; that of the females 21.4 per cent less. Throughout the remainder of the experiment the exposed rats showed a steady weight gain, and the females reached control weight after 10 months, but the males never attained more than 80 per cent. of control weights.

The exposures did not affect the descent of the testis. The onset of puberty was delayed in male rats and at 100 days spermatozoa were few. In the exposed animals, the ratio of testis weight to bodyweight was from 10.5 to 52.0 per cent. less than in the controls. This was due to marked exfoliation of the spermatids and spermatocytes at all ages of the animals. Severe disintegration of the seminiferous tubules occurred in a few animals, but in such testes there was always a layer of spermatogonia lining the basement membrane. The ratio of seminal vesicle weight to bodyweight was considerably less in the exposed animals than in the controls after 89 days of age, owing to a reduction in the volume of fluid present.

The vaginal orifice opened from 1 to 6 weeks later in exposed female rats than in controls. The ratio of ovary weight to bodyweight was less in the exposed animals than in the controls from 88 to 140 days of age, after which time the differences were not significant. Normal oestrus was found in 85 of 40 exposed females examined. Histological examination of the ovaries showed that normal ovulation occurred.

Forty females were housed with control males of known fertility; only five pregnancies developed and there were no living offspring. Breeding experiments were made with 45 exposed rats and no litter was produced.

The superiority of Tergitol-Javelle Water resulted from the greater degree of sputum solution with consequent concentration of organisms, the even distribution of bacilli in the sediment, and the fact that the reagent does not alter the capacity of acid-fast organisms to retain the fuchsin stain.

SKERMAN, V. B. D. (1949.) **A mechanical key for the generic identification of bacteria.**—*Bact. Rev.* 13. 175-188. [Author's summary slightly modified.] 1131

A mechanical key for the identification of bacteria in the Suborder *Eubacteriineae* and the Order *Actinomycetales* is submitted. Attention is drawn to the necessity for precise definitions for species and genera. This key was originally

prepared as an alternative to those provided in the fifth edition of Bergey's Manual of Determinative Bacteriology for placing bacteria into their respective genera. It has since been amended to cover the sixth edition of the Manual and is being submitted in the hope that it will be generally tested and criticized and that its deficiencies will be rectified by suggestions from workers experienced in particular fields.

Directions for the procedure adopted in describing bacteria are available in the majority of textbooks but there are no directions for the application of the information to the identification of the organisms. The only attempt to supply this guidance which covers all types of bacteria and related microorganisms is to be found in Bergey's Manual of Determinative Bacteriology. That attempt was not very successful. The fault in the Manual keys lies in the attempt to combine a system of classification with a system for identification. The alternative method suggested by S. effectively separates the two systems and should benefit both. It will be capable of marked improvement when bacteriologists provide more adequate descriptions of many listed species and genera, but in the meantime it should serve a useful purpose.

GRAY, D. F. (1948.) **A simple vacuum drying apparatus for preserving bacterial cultures.**—*Aust. vet. J.* 24. 66–68. 1132

G. describes a metal cylinder of 18 in. height and 4 in. diameter with seven rows of six metal ports, each port fitted with a short length of pressure tubing and screw clamp. Ampoules containing heavy suspensions of young cultures in sterile blood, serum or milk, with the wool plug being pushed down to a constriction in the neck, are inserted into the rubber tubing. There is a nickelled copper gauze basket filled with silica gel inside the cylinder to receive the moisture-laden air drawn from the cultures by a pump which is able to exhaust the cylinder of air down to a pressure of 1 mm. With efficient vacuum, rapid evaporation causes the fluid in the ampoules to freeze within ten min. and the pump is allowed to run until visible moisture is removed, about two hours. The ampoule contents are left under vacuum for four hours or longer and sealed. They can be stored at room temperature until required.—N. WICKHAM.

HORNIBROOK, J. W. (1949.) **A simple inexpensive apparatus for the desiccation of bacteria and other substances.**—*J. Lab. clin. Med.* 34. 1315–1320. [Author's summary copied *verbatim*.] 1133

An apparatus is described for desiccation of biologicals and other substances which is cheap in initial and operational cost and which will dry to

a predetermined moisture content. A graph is presented showing the relations between the moisture content of milk, sulfuric acid concentration, condenser temperature, and vapor tension.

LAURELL, A. H. F. (1949.) **A method of sectioning bacteria *in situ* for electron-microscopical and cytochemical investigations.** [Correspondence.]—*Nature, Lond.* 163. 282–283. 1134

An impression preparation of a young, growing culture is made on a polished glass surface and fixed with osmic acid. A beryllium filter is then fastened on to this by Hast's method. When this is stripped from the glass surfaces, it often carries with it a section through the bacterial cells with their relationship undisturbed. During the evaporation of the beryllium, some atoms of the metal penetrate the surface of the cells, thus anchoring a layer of the bacterial cytoplasm to the film. This layer is normally removed when the film is stripped. The process can be repeated and a further section obtained of the same group of cells. It is possible to treat the sectioned bacteria with enzymes or antibodies and to re-examine them.—L. M. MARKSON.

RICHARDS, O. W. (1948.) **Phase microscopy in bacteriology.**—*Stain Tech.* 23. 55–64. 1135

The phase microscope makes it possible to examine living, unstained bacteria and growing cultures in Petri dishes, even with the oil immersion lens. Measurement of the living bacterial cell is now possible.—L. M. MARKSON.

RAY, H. N., & BHATTACHARYA, A. (1948.) **A simple method of cutting serial sections of ticks.**—*Indian med. Gaz.* 83. 181–182. 1136

The authors lay emphasis on the importance of maintaining the anatomical disposition of the tick prior to section cutting.

Briefly the process is as follows: the specimens are fixed in Bouin, Duboscq and Brasil's fixative for 12–18 hours, washed in 70% alcohol, dehydrated and cleared in 2–3 changes of solvax for 48 hours and transferred to methyl benzoate. Prior to embedding they are treated in 2% solution of celloidin in methyl benzoate and then in equal parts of benzol-tissuemat mixture for two hours at bath temperature, 56–58° C.

Ticks in different stages of engorgement and the various developmental stages require different intervals for embedding in tissuemat. Unfed larvae require one hour and engorged adults 4–6 hours.—P. C. GANGULEE.

CLAUDE, A. (1949.) **Electron microscope studies of cells by the method of replicas.**—*J. exp. Med.* 89. 425–430. 1137

The formvar E (a synthetic plastic) replica method has been extended from metallurgy to

cytology. Blood cells or bacterial cells on glass slides are fixed in osmium tetroxide vapour and dried in air or over phosphorus pentoxide. The replica is formed by rapid immersion of the slide and dry specimen in 0.5% formvar E in ethylene dichloride, followed by drying in the horizontal position. The coated specimen is finally immersed in distilled water, and the replica removed on to the electron microscope mounting grid with fine forceps. A dissecting microscope is employed in this operation. The replica of the smear produces a faithful image of the original unstained cells. Electron micrographs of fowls' blood cells and of *Bacterium coli* are reproduced which indicate that some details of intracellular structure may be revealed.—C. J. BRADISH.

FABERGÉ, A. C. (1949.) **Measuring the thickness of very thin microtome sections.**—*Science*. 110. 78. 1138

The area of the hard (carnauba) wax section is first measured under the microscope. Then the section is caught on a very thin (less than 10μ) glass fibre and placed in the field of a binocular microscope. A small loop of electrically heated wire is brought close to it, the wax being allowed to melt and form a globule on the glass fibre. The volume of the sphere is calculated from its diameter; the volume of the wax divided by the area of the section gives the thickness of the original section.—L. M. MARKSON.

GROAT, R. A. (1949.) **Initial and persisting staining power of solutions of iron-hematoxylin lake.**—*Stain Tech.* 24. 157-163. [Author's abst. copied *verbatim*.] 1139

A study was made of factors affecting the initial staining power and the stability of iron-hematoxylin lake solutions. The findings were applied to the preparation of a superior hematoxylin staining solution. This is made up as follows: in 50 ml. water dissolve, in order, 1.0 g. ferric ammonium sulfate $[\text{FeNH}_4(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}]$ 0.8 ml. sulfuric acid, 50 ml. 95% ethyl alcohol, 0.5 g. hematoxylin. Filter the solution to remove the insoluble white crust of the ferric ammonium sulfate. The solution stains well ten minutes after it has been made. Peak performance is attained within 5 hours, and is maintained for 4 to 8 weeks. Staining time is 3 to 30 minutes. Excess stain can be rinsed off the slide and section by immersion in water, after which destaining, if necessary, can be accomplished with a solution of 50 ml. water, 50 ml. 95% ethyl alcohol, 0.18 ml. sulfuric acid. The slides may or may not be placed next in a neutralizing solution of 50 ml. water, 50 ml. 95% ethyl alcohol 0.5 g. sodium bicarbonate. They may then be passed through 50 ml. water, 50 ml. 95% ethyl alcohol on the way to alcoholic

counterstaining solutions, or through water leading to aqueous counterstains.

The nuclear stain produced is black, intense and very sharp and has proved to be consistently excellent on a variety of animal and human tissues following a number of different fixatives.

SPOERRI, R. (1948.) **A tri-basic-dye stain for nerve cells.**—*Stain Tech.* 23. 133-135. [Author's abst. slightly modified.] 1140

A new staining method has been developed for the study of nerve cells and Nissl granules which combines three basic dyes, cresylecht violet, toluidine blue and thionin. The use of this tri-basic-dye stain results in finished preparations that are critically stained and permanent. Paraffin sections (4μ sections preferably) are mounted on slides using a starch medium, deparaffinized and stained by the tribasic staining solution. After differentiation in acidified distilled water, sections are dehydrated, returned to stain solution and again dehydrated, then cleared and mounted in clarite. Various vertebrate material including normal and pathological human tissues have been stained with this triple dye solution. Especially for pathological material, re-immersion of slides in the staining solution and 80% alcohol before mounting, differentially intensifies the staining reaction. Fixatives used were 10% formalin, 95% alcohol, Bouin and formalin-Bouin (10% formalin followed by Bouin).

RABINOVITCH, M., JUNQUEIRA, L. C., & FAJER, A. (1949.) **A chemical and histochemical study of the technic for acid phosphatase.**—*Stain Tech.* 24. 147-156. [Authors' abst. copied *verbatim*.] 1141

A chemical and histochemical study of Gomori's acid phosphatase technic showed that the causes of its unreliability were: (1) that fixation and other steps of histological procedure inactivate the enzyme to a great extent; (2) the enzyme may diffuse, as demonstrated in frozen sections of acetone-fixed material; and (3) some absorption of lead by the sections takes place. Much of this unreliability is avoided, however, by maintaining as low a temperature as possible during fixation and dehydration, with exposure to the temperature of the paraffin oven for the shortest possible length of time. The relative insolubility and thermo-stability of the enzyme, moreover indicate the possibility of devising a more satisfactory technic in the future.

LASKEY, A. M. (1949.) **Acid thionin stain for Nissl bodies on frozen sections.**—*Stain Tech.* 24. 143-144. [Author's abst. copied *verbatim*.] 1142

Using a buffered acid thionin stain with carbol-xylene as a clearing agent, a reliable stain

for Nissl bodies may be performed on frozen sections of fresh or old formalin-fixed material in a relatively short period of time. The technic is simple: the buffering of thionin makes regressive differentiation unnecessary.

BOLLIGER, A., & McDONALD, N. D. (1949.) **Histological investigation of glycogen in skin and hair.**—*Aust. J. exp. Biol. med. Sci.* 27. 223-228. 1143

Pieces of skin of man, sheep, rabbit and phalanger (*Trichosurus vulpecula*) were fixed in formalin or alcohol and tangential paraffin sections were cut. Three staining techniques were used: Best's carmine, Schutz & Schmidt's carmine and Hotchkiss' periodic acid-fuchsine sulphite. Granules were observed in the outer hair root sheath, which stained selectively with carmine, and, after periodic acid treatment, with fuchsine sulphite. These granules were more soluble in piperazine solution than in water, and were completely removed by one hour's treatment with cold saliva. The authors conclude that these granules may contain glycogen.—L. M. MARKSON.

SMYTH, J. D., & HOPKINS, C. A. (1949.) **Ester wax as a medium for embedding tissue for the histological demonstration of glycogen.**—*Quart. J. micr. Sci.* 89. 431-436. 1144

The authors found that glycogen in tissues was impermeable to paraffin wax so that much glycogen was lost during the cutting and flattening of the sections. To avoid this, prolonged embedding was necessary, which resulted in the tissues becoming excessively hard and refractive. The problem was solved by embedding in the ester wax described by STEEDMAN [(1947) *Quart. J. micr. Sci.* 88. 123.] and thin sections of very hard material could be cut with ease.—L. M. M.

ROSENBERG, L. E., & FRIEND, J. R., Jr. (1949.) **Plastic embedding of thick celloidin sections of nerve tissue.**—*Stain Tech.* 24. 187-141. [Authors' abst. copied *verbatim*.] 1145

A method is described for mounting Golgi-impregnated and Weigert-stained thick celloidin sections of brain and spinal cord in transparent plastic. Finished mounts have good optical properties and are suitable for macroscopic and microscopic observation. The durability of such preparations makes them superior to similar material prepared by the more conventional methods. Holes of suitable size were cut in matrices of $2.5 \times 5 \times \frac{1}{8}$ inches Plexiglas. Ward's Bio-plastic was used to form a base for the holes and also as the embedding medium for the sections. Plate glass formed a working substrate and gave a polished surface to the plastic base and later to the top of the preparation. For Golgi material (200 μ) the celloidin was removed by

dioxane. A dioxane-plastic bath preceded plastic embedding. For Weigert material (30-40 μ) celloidin was not removed due to fragility of sections. Prior to plastic embedding, they were subjected first to benzol and then to a benzol-plastic bath.

NICHOLSON, D. E. (1949.) **Modified technique for the development of paper chromatograms.** [Correspondence.]—*Nature, Lond.* 163. 954-955. 1146

A modified technique in the separation of amino acids by two-dimensional chromatography is to run initially in phenol as usual and then at right angles using a 0.1% solution of ninhydrin in collidine or butanol-acetic acid. On warming the paper the colours obtained are more intense than those obtained after a ninhydrin-butanol spray and smaller quantities may be identified.

—E. M. J.

ANON. (1946.) **Technical methods in use at the Army Institute of Pathology.**—*J. tech. Meth.* 26. 1-59. 1147

This is not a reference book but a straightforward account of the technical methods used in a particular laboratory. The resulting advantage is that all the methods detailed here have given satisfactory results in routine use by the contributors. The first section concerns general procedure relating to microtomy and staining. Only four methods are used in the staining of nerve tissues, those of Keller, Weil, Spielmeyer and Bodia. The final section is on museum methods. Here Kaiserling's is the basic method, being used in its original form as well as in Lundquist's modification and in combination with Klotz's method. There is little or nothing new in the book, but the reviewer found it of considerable interest.—L. M. MARKSON.

LEA, A. J. (1949.) **Significance of Ehrlich's reaction in cases of melanuria.**—*Arch. Path.* 47. 211-214. 1148

L. discusses the chemical nature of the reactions involved in the use of Ehrlich's reagent (*p*-dimethylaminobenzaldehyde) in testing for indole and its derivatives. The Ehrlich reagent is a test for melanogen in urine but not for melanin. Urine which has a dark brown sediment and which does not give a positive reaction with Ehrlich's reagent may yet be a case of true melanuria in which the indole derivatives (melanogens) have all been oxidised to melanin.—E. M. J.

BARNES, J. M. (1948.) **The staining of the duodenal mucosa of rats following the injection of solutions of tannic acid.**—*Brit. J. exp. Path.* 29. 495-500. 1149

In adult white rats maintained on a stock diet the subcutaneous injection of 1 ml. of 20% tannic

acid produced a black staining of the duodenal mucosa, the intensity of which increased up to 10-20 days afterwards, remained stationary, then gradually faded. Variations in the amount of tannic acid and in the route of administration produced variations in the time taken for the staining to develop and disappear, and in its intensity. Sodium tannate had no such effect, nor had saturated gallic acid. The tannic acid reaction was weaker in g. pigs, absent in the single rabbit injected and variable in mice.

A brown pigment was deposited mainly in the adventitial membranes of the blood vessels of the duodenal villi. Granules were seen in neighbouring macrophages and in macrophages in regional lymph nodes. In unstained sections the pigment was dark brown or black; stained by haematoxylin and eosin it was brown; the prussian blue reaction was positive. The black pigment contained iron and was almost certainly iron tannate. No pigmentation was seen in liver and spleen or in the few kidneys examined. Results obtained by varying the iron content of the diet suggested that the process of absorption of iron from the diet played no part in the deposition of the iron-containing pigment in the duodenal villi.

The effects of gastro-enterostomy with and without occlusion of the pylorus were observed. When both pylorus and enterostomy stoma were patent, staining of the duodenum occurred as usual. When the pylorus was divided between ligatures, only a little staining occurred and that around the anastomosis. In one animal a stump of duodenum had been left on the pylorus. This was intensely stained, while the severed blind end of the loop was not stained. When the common bile duct was ligated just before injection of the tannic acid, staining took longer to develop and was not as intense as in the controls.—L. M. M.

SPINKS, A. (1949.) **Fluorimetric determination of 'antricyde'.** [Correspondence.]—*Nature*, Lond. 163. 954. 1150

S. describes in detail a method for the colorimetric determination of antricyde in plasma, involving extraction of an eosin salt of antricyde with a mixture of chloroform and butanol and giving a highly fluorescent extract. Mention is made of the use of a Coleman electronic photofluorimeter. The procedure measures down to 50 µg. of antricyde per l. of plasma with satisfactory accuracy ($\pm 10\%$) and to 20 µg. per l. with fair accuracy ($\pm 25\%$).—E. M. J.

WEBB, H. B. (1946.) **Composition of Seitz filter pads.**—*Amer. J. clin. Path.* 16. 442-447. 1151

The study of the physical characteristics and composition of Seitz filter pads indicates a lack of uniformity in their manufacture; asbestos, cellulose, cotton, flax, jute and infusorial earth,

may be used in varying proportions. Different commercial techniques are also employed in manufacture; the products are therefore not of a uniform composition. Alkalinity of the pads was evident in all instances, a property which could affect the pH of filtrates. W. considers that methods of preparation which would diminish or eliminate alkalinity would be desirable.

—L. M. MARKSON.

SONKIN, L. S. (1946.) **A modified cascade impactor. A device for sampling and sizing aerosols of particles below one micron in diameter.**—*J. indust. Hyg.* 28. 269-272. [Author's summary copied *verbatim* with additions from text.] 1152

A modification of the cascade impactor is described. It is an efficient sampler for characterization of aerosols of MMD (mass medium diameter of the entire cloud) as low as 0.25µ. It separates clouds containing particles of glycerol-water methylene blue solution below 1µ into different size classes permitting rapid and convenient size characterization of the aerosol.

The modified instrument had a critical air flow of 16.5 l. per min. and the following table gives the jet sizes, rates of flow, and limits of particle diameters.

No. of jet	Approx. dimensions of jet (cm.)	Approx. air speed through jet (m.p.h.)	Approx. range of droplet sizes
1	1.1 × 0.1	60	>0.7µ
2	0.9 × 0.08	90	1.5—0.25µ
3	0.7 × 0.05	180	1.1—0.15µ
4	0.7 × 0.02	<700	0.7—<0.1µ

PEREIRA, R. S. (1945.) **Sobre a determinação fotométrica do magnésio nos produtos de origem biológica.** [Photometric determination of magnesium in biological materials.]—*Rev. Fac. Med. vet. S. Paulo.* 3. 83-99. [English summary.] 1153

P. gives working details for the estimation of small quantities of magnesium in biological fluids, by precipitation with 8-hydroxyquinoline (for which he uses the term oxine). Aluminium, copper and iron ions in the fluid are precipitated as the "oxinates" in acetic acid-sodium acetate buffered solution. Calcium is precipitated as the oxalate. The magnesium "oxinate" is precipitated in ammoniacal solution, washed, dissolved in hydrochloric acid and coupled with diazotized naphthionic acid. Photoelectric measurements are made with the Zeiss-Pulfrich photometer with an

S 50 filter. The method may be used for as little as one-twentyfifth ml. of fluid.—I. W. JENNINGS.

LABZOFFSKY, N. A. (1949.) **An electric cauter as a sterility aid in inoculation of eggs.**—*Canad. J. Res. Sect. E.* 27. 186–187. [Author's abst. copied *verbatim*.] 1154

An electric cauter for sterilization of the opening through which embryonated egg is inoculated is described. The apparatus consists of a transformer, a rheostat, two leads, and a nichrome wire tip; the latter serves as a hot point. The temperature that develops at the tip is approximately 1000°C. and, therefore, instantaneous application of the hot point to the hole in the egg shell results in absolute sterilization of the area.

LILIENTHAL, J. L. (Jr.), ZIERLER, K. L., & FOLK, B. P. (1949.) **A simple volumeter for measuring the oxygen consumption of small animals.**—*Johns Hopk. Hosp. Bull.* 84. 238–244. [Authors' summary copied *verbatim*.] 1155

A closed circuit, constant temperature, constant pressure apparatus is described for measurement of oxygen consumption of small animals. It offers simplicity of construction from readily available materials and speed of operation.

Triplicate determinations of basal oxygen consumption in the rat agreed within ± 3.2 per cent.

ITTER, H. B., & OLESON, J. J. (1948.) **Method for biopsy of bone marrow of experimental animals.**—*Arch. Path.* 46. 498–500. 1156

Under light anaesthesia, after an incision and separation of the muscles the bone is exposed. Using a special mechanical drill, holes are drilled without penetrating to the marrow along the length of bone to be removed, so that no section of marrow is exposed before any other, the techniques used being described. The endosteum is lifted away and marrow is removed. The wound is then closed. Details of fixation which are regarded as of great importance are given.

CARTER, R. H. (1947.) **Estimation of DDT in milk by determination of organic chlorine.**—*Analyt. Chem.*, 19. 54. 1157

The method is simple and rapid, but not specific for D.D.T.; any halogen-containing insecticide such as benzene hexachloride may also be stored in milk. Details are given of the extraction of milk with ethyl alcohol and a mixture of alcohol and petroleum ether, the formation of the sodium soaps and the precipitation of the fatty acids. The filtrate from this is extracted with ether and petroleum ether and the aqueous solution used to determine the chloride ion by a

standard method, 95% or more of D.D.T. being recovered.

Determination of organic chlorine in milk of cows on a D.D.T.-free diet was less than 0.2 p.p.m. Cl_2 ; in the milk of cows given D.D.T. in the diet the range was from 1–12 p.p.m. Colorimetric determination confirmed these findings.

—E. M. J.

WASHKO, F. V. (1948.) **A method of collecting sterile blood from cattle.**—*Amer. J. vet. Rec.* 9. 359. 1158

A 14-gauge, 1-inch hypodermic needle is inserted beneath the skin and an 18-gauge 8-inch needle is passed through this to puncture the jugular vein. Blood is withdrawn into a sterile syringe attached to the 18-gauge needle.

—E. PARKER POLLARD.

PAYNE, H. G., BRATT, H. M., Jr., & BRATT, H. M., Sr. (1948.) **Rapid method for collecting dog's blood.**—*Amer. J. clin. Path.* 18. 89–91. 1159

A method of collecting dog's blood is described by means of which large or small quantities of blood can be rapidly withdrawn from the external jugular vein direct into a sterile container. For small quantities the distal end of a 15-gauge needle is inserted between the wall and the cotton plug of a sterilized centrifuge tube. For larger quantities the needle is attached to a rubber tube, the other end of which is attached to a glass tube which is inserted between the wall and the cotton plug of a centrifuge bottle. The needle is inserted into the jugular vein at an angle of 45° and the desired amount of blood collected. The operation could be repeated at frequent intervals without causing marked discomfort to the dog or injury to the vein.—CLIVE BRIGGS.

JARRETT, I. G. (1948.) **The production of rumen and abomasal fistulae in sheep.**—*J. Coun. sci. industr. Res. Aust.* 21. 311–315. 1160

A method is described, using pliable, moulded rubber cannulae, whereby satisfactory rumen and abomasal fistulae can be provided in sheep and maintained with little difficulty over a number of years. There is no leakage of gastric contents and the sheep remain in perfect health.—R. L. REID.

BURROUGHS, W., GERLAUGH, P., & BETHKE, R. M. (1949.) **The use of an artificial rumen in studying roughage digestion with rumen micro-organisms under controlled laboratory conditions.**—*J. Anim. Sci.* 8. 616. [Only abst. given, abst. from abst.] 1161

A technique is described in which rumen conditions were simulated in the laboratory and rumen micro-organisms were observed with respect to their ability to digest cellulose and other

roughage constituents. This method was developed using filter paper as the only source of roughage (cellulose) to which various known and unknown materials were added in studying their influence upon cellulose digestion. The method was extended to four good and to four poor quality roughages, those of good quality being digested efficiently without supplementation, but those of poor quality requiring supplementation for maximum cellulose digestion. Two of the most potent supplements which greatly increased rumen microbiological digestion of poor quality roughages were a complex mineral mixture and an autoclaved water extract of cow manure.

SIEGEL, L. H., & KRAEMER, M. (1948.) **Further studies on the Weltmann serum coagulation reaction.**—*J. Lab. clin. Med.* 33. 618-623. 1162

The authors describe in detail the Weltmann reaction depending on serum coagulation. Ten test tubes are arranged to contain descending concentrations of calcium chloride solution starting with 5 ml. of 0.1% CaCl_2 in the first, 5 ml. of

0.09% CaCl_2 in the second, and so on down to 5 ml. of 0.01% CaCl_2 in the tenth tube. To each is added 0.1 ml. serum. The number of the tube containing the most dilute solution of CaCl_2 in which coagulation has occurred gives the reading for the test, i.e., if coagulation appears in tubes one through six then the coagulation band is six. With normal human serum coagulation usually occurs in the first 5-7 tubes (C.B. 5 or 6 or 7). When the coagulation band is less than 5 it is said to shift to the left and when it is more than 7 it is said to shift to the right.

In the presence of an exudative or inflammatory lesion there was a shift to the left and in the presence of fibrotic lesions there was a shift to the right.

The Weltmann reaction appears to be of sufficient value to warrant its routine use in diagnosis of gastro-enteritis. In a test, when the reaction is four or less, an inflammatory lesion is usually indicated and the number reverts to normal when the lesion is healed or removed.

—E. M. J.

See also absts. 828 (bacterial growth and penicillin); 829 (sodium chloride and bacterial growth); 830 (mastitis diagnosis); 846-848 (TB. diagnosis); 853 (x. pig test in TB.); 870 (diagnosis of brucellosis); 871 (opsonocytaphagic test in brucellosis); 894 (trichomoniasis diagnosis); 899 (anaplasmosis diagnosis); 908 (electron microscopy in small pox diagnosis); 920 (Teschen disease virus culture); 928 (anthelmintic test); 1050 (needle puncture test in fluorosis); 1080 (removal of bacteria from blood stream); 1081 (measuring of blood flow).

MISCELLANEOUS

RICHARDS, O. W. (1949.) **Some fungous contaminants of optical instruments.**—*J. Bact.* 58. 453-455. [Author's summary copied verbatim.] 1163

The following molds were isolated and cultured from the glass surfaces of optical instruments: *Aspergillus niger* (obtained twice), *Monilia sitophola*, *Penicillium frequentens*, *Pullularia pullulans*, and one species each of *Alternaria*, *Bassissporium*, *Cladosporium*, and a pyrenomyces. Attempts to grow these molds on six of the commonly used types of optical glass without other nutrient matter failed. Unless the mold growth is removed from the glass surface, the moisture will damage the surface and leave it etched or raised where the mold growth occurred. Cleanliness, lowered humidity, and fungicides have been found useful protection from fouling of lenses by molds.

MADRAS, S., McINTOSH, R. L., & MASON, S. G. (1949.) **A preliminary study of the permeability of cellophane to liquids.**—*Canad. J. Res. Sect. B.* 27. 764-779. [Authors' abstr. copied verbatim.] 1164

The permeability of swollen cellophane accommodated by solvent exchange to a variety of liquid permeants has been studied. The degree

of swelling, as measured by the thickness, has been shown to be retained when the swelling agent is removed by solvent exchange. Progressive swelling causes a controllable increase in the permeability to a given liquid, but the permeability coefficient at a given thickness is specific for the liquid. For water and aqueous solutions, K is about five times that of organic permeants. Values for the organic liquids are all of the same order of magnitude and show systematic variation with the degree of swelling. For homologous series of alcohols and ketones, K decreases with increasing chain length. Attempts to calculate the effective pore radius and pore number from K and the void fraction were successful only for water and dilute sodium hydroxide solutions where a radius of 1.5×10^{-7} cm. and a pore number of 10^{12} per cm^2 were obtained. An independent method based on combined permeability and electrical conductance yielded a value of 3×10^{-7} cm. for the effective pore radius. With organic permeants, it is believed that complications introduced by swelling invalidate the application of the equations. The results obtained can be explained on the basis of viscous flow of the liquids through a porous network in which the number and dimensions of the pores vary with the degree of swelling, but evidence in favor of the validity of this mechanism is inconclusive.

REPORTS

ANON. (1949.) **The National Research Council Review.** pp. 252. Ottawa: Edmond Cloutier. 1165

The work of the Council during 1948 is described. The scientific staff, arranged by divisions and sections, is listed and there are reports by the Directors of divisions and heads of sections, and reports by specialists on the various projects. There are also accounts of the work of various committees. Much of the work is concerned with atomic energy, chemistry and building research, but there is a division of applied biology with an animal science section, a medical research division and advisory committee and a wildlife advisory committee. The animal science section has been established recently and has commenced a study of inter-relationships between homo-thermous animals and their environment using white mice and deer mice.—M. C.

NORTHERN RHODESIA. (1946.) **Veterinary Department. Annual report for the year 1946.** [HOBDAI, J.] pp. 15. Lusaka: Govt. Printer. fcp. 1s. 1166

The policy of the Department remains the same, *i.e.*, to safeguard and foster the livestock industry of Northern Rhodesia and to assist the territory to supply the deficiency that exists between low production and high consumption of livestock products. This requires the lessening of the mortality from endemic disease and the increasing of the importation of stock for slaughter from neighbouring countries.

Notwithstanding a long dry season the general conditions for stock were, on the whole, good. Despite this, loss from disease was too high, even although there had been no serious outbreak of any particular disease and even LUMPY SKIN DISEASE did not appear except in a few isolated instances. Continued success is recorded in the elimination of CONTAGIOUS PLEURO-PNEUMONIA which has not now been seen for two and a half years. The treatment of TRYPANOSOMIASIS was successful by the use of phenanthridinium compounds. FOOT AND MOUTH DISEASE caused some trouble, but was controlled by quarantine of the infected areas and an inoculation of the cattle therein, although wholesale inoculation was avoided as much as possible. It was found that infection from inoculated cattle died down in a few weeks provided that movement did not take place, but game was found to be a great reserve for the spread of the disease. A diagrammatic representation of the origin and spread of F. & M. DISEASE in South Africa is included.

Amongst other diseases mentioned are ANTHRAX, BLACKLEG and EAST COAST FEVER.

Inoculations against ANTHRAX and BLACKLEG were conducted on an increased scale, but no reduction in their incidence could be recorded, in fact there had been a considerable increase in ANTHRAX outbreaks. EAST COAST FEVER appears to have existed and caused heavy losses "across the border" in Tanganyika and must have been present in Northern Rhodesia for some considerable time, but had never made itself apparent and caused only slight mortality and had not therefore been recognized before.

2,924 specimens were examined at the laboratory and details are given in a table. The research services were, however, greatly retarded by shortage of staff. At the end of 1946, 42 assistants, trained at the school during the preceding three years, were employed by the Department.

Milk production in Northern Rhodesia was still largely seasonal and very primitive in its methods, although an increased interest in this accounted for a reduction of from 44,000 to 33,000 lb. of butter. The total number of cattle had decreased by 3,000 or 0.48%, the European-owned cattle being down by 9,000 and the African-owned up by 6,000. There was no marked change in importation and about 40% of the Territory's meat supply was imported. The total number of cattle slaughtered in the territories was 45,000, of which 43,000 were consumed locally and 2,000 exported as beef to the Belgian Congo.

Statistical tables are appended showing the total livestock population, importations and exportations of stock and the consumption of meat and livestock products.—D. S. RABAGLIATI.

GOLD COAST COLONY. (1948.) **Report of the Department of Agriculture for the year 1946-47.** [URQUHART, D. H.] pp. 16. Items of veterinary interest pp. 14-16. Accra: Govt. Printing Dept. London: Crown Agents for the Colonies. 1s. 1167

A brief report on two pig farms. Nima pig farm was managed by the Department for the Army during the war. The production during the year was sold for a total of £25,767 9s. 6d. The sales included (in lb.): bacon 86,024, ham 28,235, pork 58,132, sausages 6,661, lard 13,441, offal 3,980, and live pigs 11,951 (body weight).

The amount of fodder consumed was 1,052,223 lb. The increase produced was 1 lb. live weight gain for each 3.7 lb. of food consumed.

Total mortality was approximately 8.8%. Of these 58.33% were piglets. No analysis is given of the causes of losses. Some cases of PNEUMONIA are stated to have occurred in the rainy season but recovery was general after treatment with sulpha-

pyridine. PARTURIENT PARESIS occurred among lactating and newly weaned sows. Trials to find if dietary deficiency was a cause were inconclusive. Cases of the disease are now infrequent.

At Pokoase farm "a suspected outbreak of SWINE FEVER", introduced by imported stock, was quickly controlled by "normal precautionary measures." No other details are given.—J. A. G.

BRITISH WEST INDIES. (1947.) **Proceedings of the First West Indian Veterinary Conference at Kingston, Jamaica, 25th February-5th March, 1947.** pp. 7. Kingston: Govt. Printer. 1s. 1168

The Conference was attended by 14 representatives of six West Indian Governments.

The delegates agreed that the incidence of TB. was low in the West Indies. The principal reservoir was working cattle and steers. In Jamaica there were 6% reacting among working oxen while the figure for all cattle in the Colony was 1.6%. Lack of staff hampered eradication. It was essential that the tuberculin test should be carried out by veterinarians and that compensation should be paid by Government for slaughter of reactors.

CANINE LEPTOSPIROSIS is stated to have been imported into Antigua by a tourist's dog. The first three local dogs infected had been in close contact with the imported case.

PARALYTIC RABIES appears to have been introduced from the mainland of South America by rabies infected bats. The disease has been reported in Venezuela, Brazil and British Guiana. There have been no cases in Trinidad since 1936. In the period 1925-36 approximately 1,000 cattle mules and donkeys died annually. Anti-bat squads were formed from 1932 onwards to destroy the bats. Rabies vaccine was also used on a large scale. The disease is suspected to occur in Grenada (Windward Islands) and also in British Guiana.

EQUINE ENCEPHALOMYELITIS is essentially a disease of pastured animals. In Trinidad *Mansonia titulana*, the commonest mosquito in the Oropoucho Lagoon, was found to be infected. Cases of the disease have been recorded in man; the Western type virus of the U.S.A. was concerned in 1932 and since, and also the Eastern type in 1938. Diagnosis is based on laboratory determination of the type of virus. Control measures include anti-mosquito measures, stabling of equines in mosquito-proof buildings and vaccination of all equines in infected areas. It is essential to prevent infection of the vectors by feeding on infected horses. The disease which broke out in Trinidad in October 1943 was found to be identical with the Venezuela type. The outbreak continued up to March 1944. There were 377

cases and the cost to Government is said to have been £51,000 in loss of animals and £100 for vaccine obtained from Venezuela.

In the Bahamas the Eastern type of virus was introduced from the U.S.A. Losses in the Bahamas amounted on some islands to 90% of equines. Jamaica quarantine restrictions are based on the difficulty of excluding possible carriers. Extensive vaccination in the U.S.A. and Venezuela has not eradicated the disease, and the animals which recovered, even if vaccinated since infection, were possible carriers.

The cause of the spread of SWINE FEVER is attributed to swill containing imported pork products. Prohibition of imports of pork products, sterilization of all swill and the use of crystal violet vaccine under Government supervision, are considered to be adequate control measures. Slaughter of infected pigs and vaccination of all in-contacts has sufficed to control the outbreaks.

A brief review of MINERAL DEFICIENCY DISEASES was given. In the Leeward Islands Hutson recommends mineral mixture No. 1:—common salt 100 lb., red oxide of iron 25 lb., copper sulphate 1 lb, cobalt sulphate 2 oz., and mixture No. 2:—sterilized bone meal. These are put out in separate troughs. There is no danger of over-feeding as consumption falls off as nutritional requirements are satisfied.

Most of the cattle live on either alluvial soils or on a terra rossa formation. This red earth is said to be the insoluble residue from the limestone in which there is free drainage through the underlying rock and all soluble soil components are washed away. On a survey of 200 blood analyses of cattle, it seemed possible to state (i) Ca deficiency was rare and unlikely, (ii) P. and Mn. were often deficient, especially on red soils, (iii) many of the cattle of Jamaica are very anaemic. In many cases this resulted from tick-borne disease or helminth infestation. The feeding of phosphorus supplements is recommended. A balanced supplement is available in the form of deposits from bat-infested caves. This has a well balanced Ca : P ratio and low fluoride content.

A condition was observed affecting cattle of all ages in which lime salts are deposited in the endocardium and endothelium of the large arteries. The possibility of the condition being caused by magnesium deficiency was mentioned. The necessity of further investigation of this and many other conditions possibly caused by nutritional imbalance was emphasized.

Details are given of the measures available and those used in the West Indies for controlling TICK INFESTATION.

Conditions and application of known means of control of HELMINTH INFESTATIONS do not

appear to be very advanced in the West Indies as a whole.

In the discussion the Jamaica representative

claimed that the most suitable type of mule for the West Indies could be provided from Jamaica.

—J. A. GRIFFITHS.

BOOK REVIEWS

BROWNING, C. H. [M.D., LL.D., D.P.H., F.R.S.; Gardiner Professor of Bacteriology, University of Glasgow], & MACKIE, T. J. [C.B.E., M.D., LL.D., D.P.H.; Professor of Bacteriology, University of Edinburgh]. (1949.) **Textbook of bacteriology (Eleventh edition of Muir & Ritchie's "Manual")**. pp. x + 907. London, New York, Toronto: Geoffrey Cumberlege, Oxford University Press. 50s. 1169

"Muir and Ritchie" first appeared in 1897: the 10th edition was published in 1937. The present authors began their collaboration with Professor Muir in producing the 8th edition in 1927 and they have now most wisely decided to recast the whole book, to set it on a larger page and to reduce the amount of small type. The result is a book which is about the size of one volume of "Topley and Wilson", is well set out and printed and contains evidence of extensive revision and rearrangement of its contents.

The general scope of the book remains unaltered. It sets out to give a critical survey of present knowledge, together with an account of the basic information provided by laboratory and clinical investigations. An account of general laboratory methods is given in an appendix of 90 pages and is a valuable feature of the book. Diseases of animals are also dealt with, although they naturally receive less space than those which primarily affect man. Selected lists of references are collected at the end of the book and are grouped under the chapter headings. There are numerous references for the years between 1939 and 1948.

The first three chapters deal with general bacteriology and immunity. There follow 23 chapters devoted to bacteria causing disease in man and animals, four chapters on viruses, one on fungi, four on protozoa and one on chemotherapy.

To the veterinarian the small section on trypanosomiasis in animals (pp. 684-687) is disappointing. It remains almost the same as in the 1927 edition (pp. 690-694) and needs revision. It begins with the sentence "Nagana deserves special mention since there is little doubt that a proportion of cases, if not all, are due to a trypanosome (*T. rhodesiense*) which is capable of infecting man. . . .". And yet in the preceding section dealing with human trypanosomiasis the relations between *T. gambiense*, *T. rhodesiense* and *T. brucei* are discussed and it is stated that *T. brucei* is

non-infective for man and that the three trypanosomes probably represent biological races of a single species.

The chapter on immunity does not mention transmission of antibodies through the placenta or in colostrum and the index gives no clue to these methods of transfer of immunity although there is mention of colostrum in the few lines devoted to immunization against lamb dysentery (p. 440).

This enlarged and transformed "Muir and Ritchie" reflects great credit on its authors and will continue to maintain the tradition of earlier editions as a standard textbook for medical students and practitioners. It will also be of value to others, including veterinarians, because of the clarity of its descriptions and the wide background of bacteriological knowledge against which the diseases of man and animals are described.—E. G. WHITE.

CUMMINS, S. L. [C.B., C.M.G., LL.D., M.D.; Late Colonel, Army Medical Services; formerly Professor of Tuberculosis, Welsh National School of Medicine]. (1949.) **Tuberculosis in history from the 17th century to our own times**. pp. xiv + 205. London: Baillière, Tindall & Cox. 21s. 1170

The material selected by the late Prof. Lyle Cummins as the subject matter of this book presents a picture of the gradual discovery of the main clinical and pathological characteristics of human phthisis.

The first section is concerned with the British School of phthisiologists and covers the period from the 17th to the end of the 19th century. The early observations of BENNET, WILLIS, and MORTON lead to a detailed description of MARTEN's remarkable book (first published in 1719), while notes on SYDENHAM's exercise therapy lead to an account of the systematic, open-air, "sanatorium" treatment advocated by BODINGTON. STARK's work on morbid anatomy, CARSON's ideas on the principles of artificial pneumothorax, and BUDD's letter to the *Lancet* (1867) suggesting that phthisis is disseminated through specific germs are discussed in the remaining chapters of the section.

The second part is devoted to six early continental phthisiologists while the third deals with the lives and labours of TRUDEAU and KOCH—those two "remarkable figures in the history of tuberculosis". In the former section due recogni-

tion is given to the genius of LAENNEC and to the remarkable research work of VILLEMIN while, in the latter, stress is laid on the heroic struggle of TRUDEAU and on the meticulously careful work of KOCH.

The book is accurately indexed and well illustrated.—J. LOCHIEL MCGIRR.

REICHENOW, E. (1946.) *Grundriss der Protozoologie für Aerzte und Tierärzte. [Fundamentals of protozoology for medical and veterinary workers.]* pp. 99. Leipzig: Johann Ambrosius Barth. DM. 8.40. 1171

It is explained that this short book is primarily intended to describe the pathogenic and harmless protozoa of man and domestic animals, so that they can be recognized and differentiated. The most important methods of demonstrating infection and of cultivation outside the body are given, and the mechanism of their pathogenic action is discussed, but no attempt is made to describe the clinical symptoms, or the methods of investigating their presence in insect carriers, as these matters are dealt with in books on tropical medicine and entomology.

The book is divided into two sections, the first dealing generally with the structure, vital processes, methods of multiplication, and the development cycles of protozoa, and the second with descriptions of the various organisms included in the classes *Rhizopoda*, *Nastigophora*, *Sporozoa* and *Ciliophora*. A brief description of *Toxoplasma* is given in the section dealing with the *Sporozoa*, though it is admitted that their real nature is uncertain, whilst *Anaplasma* are dismissed as being probably viruses.

The possibility that pigs may play a part in the epidemiology of human amoebiasis is not mentioned. As the book was published in 1946, the information given on the human malarial parasites is not entirely up to date.

In respect of the parasites of domestic animals there are important omissions. *Trichomonas gallinae*, the causal organism of pigeon trichomoniasis is described under the name *Tr. hepatica*, but *Tr. gallinarum* which has been accused of causing enteritis in young turkeys is not mentioned, nor are the species of *Cochlosoma* and *Hexamita* which have been found associated with fatal illness in turkeys. The information given on animal trypanosomiasis is sound, except that *Trypanosoma congolense* infection is said to yield to treatment with congasin [surfen C.], a drug which has proved unreliable. The description of the coccidia of domestic animals and poultry is not given in sufficient detail to allow a differentiation of species, an important consideration in respect of control and treatment. In cattle pathogenicity is ascribed to *Eimeria zurni*, but

probably *E. bovis* is the most pathogenic species. No mention is made of the value of the sulphonamides and mepacrine in treatment. *Globidium* is said to be a stage of *Eimeria*, but although this statement may be true of the intestinal forms, it ignores the cutaneous *Globidium* infection of horses and cattle to which considerable pathogenicity has been ascribed recently. *Babesia argentina* and *B. major* of cattle are not mentioned, whilst the strain of *B. canis* transmitted by *Dermacentor reticulatus* is mentioned under the name *B. vogeli*, which does not appear to be justifiable until further work has been done on the absence of cross-immunity between strains of *B. canis*. The author gives his own findings on the development cycle of *Theileria parva*, but ignores the findings of other workers, although the latter offer a better explanation of the epidemiology of East Coast fever. No mention is made of the *Leucocytozoon* infections of fowls.—U. F. R.

HOARE, C. A. [D.Sc. (Lond.); Protozoologist to the Wellcome Laboratories of Tropical Medicine, London]. (1949.) *Handbook of medical protozoology.* pp. xv + 334. London: Baillière, Tindall & Cox. 35s. 1172

This book fills a gap in the list of English medical literature. It does not deal with the clinical and therapeutic features of protozoan diseases but is devoted mainly to the parasitological aspects and especially emphasizes host-parasite relationships. It deals almost entirely with human protozoology, but will be of some value to veterinary workers, as the author puts it in his preface: "It is hoped that it will also be of service to . . . veterinary practitioners. For the latter the interest lies chiefly in the comparative aspects of medical protozoology, in view of the part played by lower mammals as reservoir hosts of human protozoal infections".

The book is in three parts: first a general account of the protozoa which deals with structure, reproduction, physiology, classification and ecology; then a systematic account of the group followed by a section on diagnostic methods. An account of the historical development of our knowledge and references to authorities have been omitted. There is a short bibliography and an adequate index. To the veterinarian the third part of the book, namely that dealing with diagnostic methods, will probably be of greatest value.

—M. C.

REMLINGER, P., & BAILLY, J. (1947.) *La rage. Etudes cliniques, expérimentales et immunologiques. [Rabies. Clinical, experimental and immunological studies.]* pp. v + 192. Paris: Librairie Maloine. 1173

This is a résumé of 20 years' work on rabies.

begun in Constantinople and continued in Tangiers. Comparisons are made between early Pasteurian and present-day methods, and it is interesting to note that desiccation of cords has disappeared from all institutes with the exception of the Paris Institute. Phenolized vaccines have made decentralized treatment possible.

The book is set out under numerous chapter headings and subheadings dealing with rabies in all its aspects with experimental proof to support the authors' theories. Many interesting questions are raised which still remain to be answered. In the first chapter it is agreed that a chronic form of rabies does exist, but that it is far too often diagnosed. There is also some speculation on the possible existence of a pneumonic form. One case of rabies simulating Aujeszky's disease in a mule is quoted.

Details are given of the manifestations of rabies in all animals and the recovery of virus from all organs containing nervous tissue is well established. There is an interesting speculation on the possibility of virus developing in the blood of ticks. The authors also raise the question whether the difference between "fixed" virus and "street" virus is comparable to the difference between smooth and rough strains of bacteria. Conservation and attenuation of virus is dealt with in detail. Polyvalent vaccines are not thought necessary, the existence of atypical strains of "street" virus as a cause of failure to immunize is strongly denied. "Fixed" virus, on the other hand, has been found to vary between different Institutes. Standardization with periodic testing of virus is advocated, and at the same time the authors wonder whether "fixed" virus ought not to be less attenuated to give protection against street virus. The successful use of phenolized vaccines in all domestic animals is quoted. Finally, tribute is paid to Italian workers. The need for a new International Conference on rabies is felt and an agenda is suggested covering many aspects, particularly standardization of treatment.

—G. V. LAUGIER.

TRAUTMANN, A., & FIEBIGER, J. (1949.) *Lehrbuch der Histologie und vergleichenden mikroskopischen Anatomie der Haustiere. [Textbook of histology and comparative microscopic anatomy of domestic animals.]* pp. xii+400. Berlin, Hamburg: Paul Parey. 8th & 9th Edit. D.M. 46. 1174

The widespread use of this well-known textbook in many countries had necessitated the preparation of an eighth edition. In 1945 the entire stock of text and illustrations of this edition was destroyed by bombing and it was left to Professor Trautmann to prepare a ninth edition as soon as possible after the end of the war. It was

not possible for the other author, Professor Fiebiger, to collaborate in producing this edition. The text has been revised and many new illustrations, both black-and-white and coloured, have been used but the book retains its original scope and format.

The ratio of pages of text to number of illustrations is approximately 4:5 and each illustration shows clearly the features discussed in the text: that is the advantage of black and white drawings prepared by a skilled artist as compared with photomicrographs. Almost all the illustrations are from the organs and tissues of domestic animals. The book is printed on good quality paper and is well bound. There are no references to the literature.

The new edition will serve well the needs of all who require a textbook of comparative histology and who do not require the detail of more exhaustive works. Veterinary students who can read German are fortunate in having so useful a text and in being able to obtain a more real understanding of veterinary histology than can be obtained from a medical textbook of the subject. It is a pity that the preface to the earlier editions has not been retained because this served to indicate the scope of the book. The present preface merely sets out the fate of the 8th Edition and the difficulties under which this, its successor, was produced.

The book is intended primarily for veterinary students in German-speaking countries. A Spanish translation of previous editions was available.

—E. G. WHITE.

SEIFRIED, O. [Formerly Director of the Institute for Animal Pathology, University of Munich], COHRS, P. [Director of the Pathological Institute of the Veterinary College, Hannover], & BAUMANN, R. [Director of the Institute of Pathological Anatomy, Veterinary College, Vienna] [Revised by]. (1950.) *Kitt—Lehrbuch der allgemeinen Pathologie für Tierärzte. [Kitt's textbook of general pathology for veterinarians.]* pp. xii+457. Stuttgart: Ferdinand Enke. D.M. 39.20. 1175

Theodor Kitt, whose book had a wide circulation all over the world, died in 1941 when six editions had appeared. The latest edition has been entirely re-written and revised and has gained much from the personal experience of each of the three authors. One of them, Oskar Seifried, died in 1947 before the edition was published, but was responsible for rather more than a third of the text and many of the new illustrations.

The text follows the usual plan—introduction, causes of disease, degenerations and infiltrations, circulatory changes, repair, regeneration and

inflammation, and congenital abnormalities. There are 139 illustrations and 12 pages of colour plates: the number of illustrations could with advantage be increased. A number of authors, mainly German, are referred to in the text but, actual references are not always given. Although the text has benefited from the personal experience of the authors there is a need to refer to work done on problems of general pathology outside Germany during the last 20 or 30 years, rather than to quote merely from older work. The contributions to the study of inflammation, for example, made during the last 20 years deserve mention and there are many other examples of recent work which could with advantage be introduced. The difficulties of the war years and those which have followed have doubtless made it difficult for German workers to keep abreast of the literature of other countries: this excuse is made in the preface and is probably justified, but it would seem preferable in that event to draw freely from one or other of the well-known textbooks now available or at least to point out that considerable advances have been made during the last 20 years or so.

In spite of these criticisms this book does meet a very real need. It gives an account of general pathology which is based on disease processes observed in domestic animals and the examples given are those which the veterinary student and practitioner will himself encounter. For this reason the teaching is likely to appeal more directly and to be appreciated more fully and there is no doubt that Kitt's book will serve as a valuable tool for the instruction of veterinary students in general pathological anatomy.

Most of the illustrations and all the colour plates are in the latter half of the book, where glossy paper has been used. It would be preferable to distribute them more evenly so that they appear close to the text matter and receive the attention they deserve. The book is well printed and bound.—E. G. WHITE.

GADDUM, J. H. [Sc.D., F.R.S., M.R.C.S., L.R.C.P.; Professor of Pharmacology in the University of Edinburgh]. (1949.) **Pharmacology**. pp. xvi+504. London: Geoffrey Cumberlege, Oxford University Press. 3rd Edit. 25s. 1176

The author states that this edition is up to date to the beginning of 1947 and that the additions or alterations include the text dealing with folic acid; actions of drugs on endocrine glands; drugs acting against acetylcholine, adrenalin and histamine; ergot; anticoagulants; diuretics; plasma proteins; B.A.L.; insecticides; detergents; malaria; sulphonamides; streptomycin and penicillin.

These changes enlarge on the original scope

of a book written for pre-clinical medical students and others interested in the mode of action of drugs generally. Accounts of newer experimental methods are also included. The book begins with a useful bibliography, has some general references as footnotes and is well indexed. It suffers inevitably by being already outdated by the more recent advances on the subject (*e.g.* the advent of chloromycetin and aureomycin, vitamin B₁₂, and sulphetrone for leprosy), since it was written some three years ago. The book is attractive, well bound and printed on almost pre-war quality paper.—MALCOLM WOODBINE.

CLARKE, H. T., JOHNSON, J. R., & ROBINSON, R. [Edited by]. (1949.) **The chemistry of penicillin. Report on a collaborative investigation by American and British chemists under the joint sponsorship of the Office of Scientific Research and Development, Washington, DC., and the Medical Research Council, London. Compiled under the auspices of the National Academy of Sciences, Washington, DC., pursuant to a contract with the Office of Scientific Research and Development.** pp. x+1094. Princeton, New Jersey: Princeton University Press. London: Geoffrey Cumberlege. £9 9s. 1177

This monograph represents an attempt to record in detail results of experimental and theoretical studies carried out in a unique, internationally collaborative effort to ascertain the chemical constitution of penicillin and to devise methods for its synthesis.

The earliest work on production was carried out at Oxford and in 1942 the Ministry of Supply set up a General Penicillin Committee. At this time production was instituted in laboratories of certain American pharmaceutical manufacturers. After October 1943 a limited group of industrial and academic research organizations collaborated in studies on the chemical structure and synthesis and copies of all reports were filed with American and British participants in both countries. A list of these participating groups is given.

Shortly after the cessation of hostilities it was decided to publish these findings in a monograph and at a conference in 1946 the authors for the chapters were selected on the basis of special familiarity with the field and on condition that they should report impartially on pertinent information irrespective of source; in general the chapter topics were distributed according to organic chemical classification and physico-chemical techniques.

All research workers and others who are interested in the study and applications of penicillin will be exceedingly grateful to the authors for the prodigious task of assembling so much

precise information on penicillin in so comprehensive a form.—E. M. J.

EMMENS, C. W. [D.Sc., Ph.D.; National Institute for Medical Research, Hampstead, London, N.W.3]. (1948.) **Principles of biological assay.** pp. 206. London: Chapman & Hall. 21s. 1178

This is the statistical *vade-mecum* for the assayist. The author leads the reader skilfully through this difficult subject, pointing out in the first place the necessity for the mathematical approach (chapter I), then providing clearly and succinctly the basic statistical equipment required (chapters 2–8), the use of which is demonstrated in examples of assays based on quantitative measurements (chapters 9–13) and on discontinuous measurements (chapters 14–16). The less common types of assay are covered by chapters 17 (assays based on reaction times) and 20 (Common-Zero 5-point design). The intervening two chapters cover methods of combining results from a set of tests and some miscellaneous matters which might be headed "sound advice".

The title might mislead mathematicians, who would assume that the book is a treatise on the mathematical theory of biological assay; in point of fact it is a very practical handbook offering sound advice on the design and layout of the assay, with numerical examples which might be used as models for the computation of routine assays.

Since it brings together a number of methods previously available only in the pharmacological or statistical journals, the book will be welcomed by experienced assayists; the novice in statistics will find it an intelligent introduction to the subject, demanding from him only a knowledge of arithmetic and very elementary algebra.

—F. B. LEECH.

MANSFIELD, G. [M.D.; Professor of Physiology, University of Budapest]. (1949.) **The thyroid hormones and their action.** pp. xii+157. London: Frederick Muller, Ltd. 24s. 1179

If anyone is to make the effort necessary to read this book, he should be a specialist in thyroid physiology. The author gives an account of his work on the physiology of the thyroid gland which he claims has led him to the discovery of three new hormones. The first he calls a "myelotropic" hormone which is said to stimulate the formation of an anti-anaemic principle in the liver. The other two are called thyrothyryns which are said, in the normal animal, to have a tendency to lower basal metabolism. Certain evidence is also advanced which is interpreted as indicating that thyroxin acts by penetrating the interiors of cells *via* the nerves and causing acceleration of the enzyme processes. The author makes many

statements which contradict accepted theories; this in itself is useful if the statements are backed by strong experimental evidence, but one cannot say that the experiments reported in this book are convincing. Insufficient allowance is made for the normal variability of the material and the majority of the experiments can be interpreted equally well by other theories than those put forward by the author.

The translations could be considerably improved by inserting the correct technical terms in the very numerous places where the wrong word has been used, but the best of translations would not hide the defects of a style unsuited to the exposition of scientific experiment.—F. B. L.

ALLEE, W. C. [Professor of Zoology, The University of Chicago], EMERSON, A. E. [Professor of Zoology, The University of Chicago], PARK, O. [Professor of Zoology, Northwestern University], PARK, T. [Professor of Zoology, The University of Chicago], & SCHMIDT, K. P. [Chief Curator of Zoology, Chicago Natural History Museum]. (1949.) **Principles of animal ecology.** pp. xii+837. Philadelphia & London: W. B. Saunders Co. Ltd. 70s. 1180

Ecology has existed as a formulated science for a relatively short time, yet during the last 20 years and since Elton's "Animal Ecology", such rapid progress has been made that a comprehensive text-book has become a real need to all practising biologists.

This book is a symposium which gathers together certain fundamental concepts and endeavours to supply an orientation on the subject to the scientific worker. It comprises five principal sections. Section (1) is a historical introduction dealing with events before and since 1900; Section (2) analyses the various factors which affect the environment: the changes in the physical and chemical components of the medium in which the organism lives; Section (3) considers populations: their specific characteristics as well as those which they share with the individual organism; Section (4) discusses the community: the broadly self-sufficient basic association between different kinds of organisms which is the chief study of the professional ecologist, while Section (5) correlates ecology and evolution, a highly important aspect of the subject of ecology which is essentially an outgrowth of nineteenth century natural history with its emphasis on evolution. In addition to these principal sections the book includes an extensive bibliography. It is produced on good quality paper in rather small type and is a comprehensive treatise. The price is rather high.

Ecology is not an easy subject, for it is built directly on a higher knowledge of a very wide

range of physical sciences. As such it has not entered into the curricula of veterinary schools and with a few exceptions those engaged in veterinary research have not made it their concern. Yet all workers with an appreciation of modern developments in biology are agreed that infectious disease must be considered along ecological lines, regarding such disease as the result of imbalance between a host and its parasites whether helminths, protozoa, arthropods, microbacteria or viruses. All living things have an ecology and those producing disease are not exceptional. The behaviour of disease in an animal population is

essentially an ecological problem so that a knowledge of ecology is of importance to all who are interested in animal populations, animal management, or disease control.—S. BRIAN KENDALL.

BOTTENBERG, H. (1948.) Die Blutegelbehandlung. [Leeches in the treatment of disease.] pp. 223. Stuttgart: Hippokrates-Verlag Marquardt & Cie. 1181

The biology of the leech, *Hirudo medicinalis*, the history of leech therapy in human medicine and methods of modern therapeutic use of the leech in man is discussed.—E. G.

BOOKS RECENTLY RECEIVED

[Notice of recently received books in this list does not preclude review]

ALBRIGHT, F., & REIFENSTEIN, E. C., JR. (1948.) **The parathyroid glands and metabolic bone disease.** pp. xxvi + 393. Baltimore: The Williams & Wilkins Co. London: Baillière, Tindall & Cox.

BUCHER, O. (1950.) Histologie und mikroskopische Anatomie des Menschen mit Berücksichtigung der Histophysiologie und der mikroskopischen Diagnostik. [Human histology.] pp. xi + 467. Bern: Hans Huber. Sw. fr. 59.50.

BURSTEIN, C. L. (1949.) **Fundamental considerations in anesthesia.** pp. xi + 151. New York; London: The Macmillan Co. \$ 4.00. (30s.)

CARTER, C. W., & THOMPSON, R. H. S. (1949.) **Biochemistry in relation to medicine.** pp. xi + 442. London; New York; Toronto: Longmans, Green & Co. 25s.

CRAPLET, C. (1950.) Maladies du mouton et de la chèvre. [Diseases of sheep and goats.] pp. 138. Paris: Vigot Frères.

FAIRBROTHER, R. W. (1949.) **A text-book of bacteriology.** pp. viii + 484. London: William Heinemann Medical Books Ltd. 6th Ed. 20s.

FRANCES, T., Jr. (Revised by). (1948.) **Diagnostic procedures for virus and rickettsial diseases.** pp. vii + 347. New York City: American Public Health Association. 1st Edit.

FRANKLIN, K. J. (1949.) **A short history of physiology.** pp. 147. London: Staples Press. 2nd Edit. 10s. 6d.

HABEL, R. E. (1949.) **Guide to the dissection of the cow.** pp. vi + 127. Ithaca, New York: Cornell Cooperative Society.

KEEFER, C. S. (1949.) **The uses of penicillin and streptomycin.** pp. 72. Lawrence, Kansas: University of Kansas Press. Porter Lectures, Series 15. \$2.

MAISIN, J. (1948.) Cancer. I. Hérité—hormones—substances cancérogènes. II. Radiations, Virus, Environnement. [Cancer. I. Heredity—hormones—cancerogenic substances. II. Radiations, virus, environment.] pp. 248 & 306. Tournai-Paris: Casterman. Fr. 84 & 120.

MARQUARDT, M. (1949.) **Paul Ehrlich.** pp. xx + 255. London: William Heinemann Medical Books Ltd. 25s.

MCDUGALL, J. B. (1949.) **Tuberculosis. A global study in social pathology.** pp. viii + 455. Edinburgh: E. & S. Livingstone Ltd. 32s. 6d.

MEANS, J. H. (1949.) **The function of the thyroid gland.** pp. 37. Oxford: Blackwell Scientific Publications. 1st Edit. 5s.

MULLIGAN, R. M. (1949.) **Neoplasms of the dog.** pp. xi + 135. Baltimore: The Williams & Wilkins Co. London: Baillière, Tindall & Cox.

PRINCE, J. H. (1949.) **Visual development.** Vol. I. pp. xii + 418. Edinburgh: E. & S. Livingstone Ltd. 50s.

RAPPAPORT, F. (1949.) **Rapid microchemical methods for blood and CSF examinations.** pp. xviii + 404. New York: Grune & Stratton, Inc. \$8.75.

VICARD, A. (1950.) Les laparotomies chez les bovins. [Bovine laparotomy.] pp. 56. Paris: Vigot Frères. 1st Edit.

VOLKER, R. (1950.) Eugen Fröhner's Lehrbuch der Toxikologie für Tierärzte. [Eugen Fröhner's textbook of toxicology for veterinarians.] pp. xx + 404. Stuttgart: Ferdinand Enke. 6th Edit. DM. 33.

WINSLOW, C.-E. A., & HERRINGTON, L. P. (1949.) **Temperature and human life.** pp. xiv + 272. London: Geoffrey Cumberlege. 28s.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications searched for this purpose was circulated with the *Veterinary Bulletin*, Vol. 20, No. 1.

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